THE REALITIES OF DISABILITY AND POVERTY IN LATIN AMERICA

by

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ABSTRACT

Disability and poverty are related: there is a higher risk of disabled people becoming poor and of poor people becoming disabled. Although this relationship is recognised within disability scholarship, there is a lack of empirical evidence particularly in the context of Latin America.

Taking data from five Latin American Countries (Brazil, Chile, Colombia, Costa Rica and Mexico), this study tests the hypothesis that households with disabled members have higher levels of poverty compared with other households. Two research designs were used: a small-N comparative variable-oriented design using most-different cases; and a cross-sectional design. Secondary data analysis revealed that households with disabled members have higher levels of poverty using direct and indirect measures (e.g. income; subjective and multidimensional indices) compared with other households and that this held true across the five countries studied.

The findings from this research have salience for policy makers internationally. The most important policy implication is that disabled people and their families need to be explicitly included in poverty reduction strategies and their extra needs should be recognised within these policies. Mitigating the risk of poverty for disabled people should be a universal policy goal.

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LIST OF ABBREVIATIONS

A-K – Alkire-Foster Methodology

ADL – Activities of daily living

CA – Capability Approach

CASEN - National Survey for Socioeconomic Characterization

CCT – Conditional Cash Transferences

CPC - Collective Partial Capitalization

CRPD – Convention on the Rights of Persons with Disabilities

ECLAC - Economic Commission for Latin American and the Caribbean

ENIGH - Encuesta Nacional de Ingresos y Gastos de Hogares

FGT - Foster, Greer and Thorbecke

FAO - Food and Agriculture Organization of the United Nations

GDP - Gross Domestic Product

GNI - Gross National Income

HDI - Human Development Index

IADL – Instrumental Activities of Daily Living

ICIDH - International Classification of Impairments, Disability and Handicaps

ICF - International Classification of Function, Disability and Health

IDB - International Development Bank

ILO - International Labour Organization

IPUMS - Integrated Public use Microdata Series

ISI - Import Substitution Industrialization

LA - Latin American

LAC - Latin American and the Caribbean

LSMS - Living Standards Measurement Survey

MDGs - Millennium Development Goals

MIC - Middle income countries

MPI - Multidimensional poverty index

MW - Minimum Wage

NGO - Non-governmental Organizations

PAYGO - Pay as you go

PNAD - Pesquisa Nacional por Amostra de Domicilios

PSU - Primary Sampling Unit

QoLS - The Quality of Life Survey

ROC - Receiver Operating Characteristics

SSU - Secondary Sampling Units

UBN - Unsatisfied Basic Needs

UN - United Nations

UNDP - United Nations Development Programme

UK - United Kingdom

WB - World Bank

WG - Washington on Disability Statistics

WHO - World Health Organization

CHAPTER 1

INTRODUCTION

Disability and poverty are related. Exclusion from health care, education, labour and participation are fundamental aspects in the creation of the bidirectional relationship between disability and poverty.

In the last two decades the understanding of the concepts of disability and poverty has changed. Indeed, disability moved from an individual to a social model. In the first model, disability was understood as an individual problem and the state should provide health care attention. By contrast, in a social model aspects related to the role of society in the construction of disability are recognised and states should guarantee access to social opportunities and services and eliminate sources of discrimination against people with disabilities (Oliver, 2009, Oliver and Barnes, 2012). In addition to the two models, the World Health Organization (WHO) proposed the biopsychosocial model in the International Classification of Functioning, Disability and Health (ICF) in 2001. This model presents an alternative approach to understanding disability, where individual and social aspects play a fundamental role. Disability is defined as the result of an interaction between a health condition and social-environmental factors that act as barrier for social inclusion of people with different impairments (World Health Organization (WHO), 2001). The model proposed by the WHO has had a large influence in how disability is measured and a similar definition was also included as part of the United Nations Convention on the Rights of Persons with Disabilities (CRPD) (United Nations (UN), 2008a).

In the last two decades, it has been recognised that poverty is not only related to lack of or insufficient income, it is a complex situation, where access to opportunities and services play a fundamental role in the creation and duration of poverty. This situation affects individuals and families and it is related to a lack of practical opportunities to choose the lives people want and enjoy to live (Sen, 1999). In this context, the analysis of poverty is conducted from a multidimensional perspective, where important dimensions of development (e.g. health, education, living standards, empowerments, labour and participation) become the centre of the analysis. This allows a more detailed and in-depth study of levels of deprivation of a country and how those vary between groups (Alkire and Foster, 2011a, Alkire and Santos, 2013b).

In the last 15 years, the number of studies aiming to describe the relationship between disability and poverty in low and middle income countries has increased (Groce et al., 2011a). The World Bank (WB) published a review of the literature on this topic in 1999 (Elwan, 1999). This review argued that around 15% to 20% of poor people in developing countries have disabilities and that households with disabled members have a higher risk of poverty (Elwan, 1999). It has been recognised that disability increases the risk of poverty and that poverty increases the risk of disability, which results in people with disabilities constituting a large percentage of the poorest of the poor (Yeo, 2003, Yeo and Moore, 2003).

Disability and poverty have a bidirectional relationship; meaning that disability is both a cause and a consequence of poverty (Braithwaite and Mont, 2008, Elwan, 1999, Yeo and Moore, 2003). On the one hand, low levels of nutrition, limited

access to preventive health care, violence and low access to sanitation and to a source of clean water are some factors that increase the risk of becoming chronically ill for poor populations. On the other hand, people with impairments face extra costs and barriers in their access to health care services, including rehabilitation and technical aids; they are socially excluded from education and employment and have to assume direct, indirect and opportunity costs, which negatively affect their income and consumption (Elwan, 1999, Groce et al., 2011a, Groce et al., 2011b, Palmer, 2012, Yeo, 2005, Yeo and Moore, 2003). This is not a universal cycle that affects all poor or disabled individuals. However, people living in poverty and people with impairments face higher risks of becoming disabled and poor, respectively.

As a consequence of the changes in understandings of poverty and disability, currently the study of why and how disability and poverty are related is moving from an income-based to a multidimensional approach. In this context, not only the effect of an impairment on the levels of income of an individual or a household are analysed, but also the levels of deprivation in different dimensions of development of people with disabilities and their families. Additionally, those deprivations which are associated with an increase in the risk of illness and disability of multidimensional poor individuals have also been analysed.

Latin America (LA) is a classified by the WB as a developing region; it is comprised of 18 independent republics and 15% of the population of the world lives in this region. In the last two decades, socioeconomic indicators have positively improved. Indeed, a strong reduction in child and infant mortality has been

observed in the last decade, with improvements in literacy rates and Gross National Income (GNI) per capita (WB, 2014). However, these achievements have not been shared in the same proportion for all LA countries. In fact, there are severe differences between countries classified as very high human development and middle human development (United Nations for Development Programme (UNDP), 2014). Although the levels of human and economic development of LA as a region have improved in the last decades (WB, 2014), still the region has high levels of income and opportunity inequality and poverty (De Ferranti et al., 2004, Gasparini et al., 2009, Nora Lustig, 2009).

The understanding of disability in LA has been mainly influenced by the UN and the WHO. Two main documents have influenced how government understand and define disability in their legislations and social policies: The Standard Rules of Equalization of Opportunities for Persons with Disabilities and the CRPD (International Disability Rights Monitor (IDRM), 2004, Mujica, 2003, Samaniego, 2006, Stang Alva, 2011). Although most LA countries have legal documents that protect and guarantee the human rights of people with disabilities, in only a few cases, is it explicitly mentioned the importance to collect statistical data aiming to monitor socioeconomic and living conditions of this group and their families. As a consequence, the study of the prevalence and magnitude of disability in LA has been limited. Additionally, the study of the relationship between disability and poverty has also been limited by the lack of data sources that include questions on disability and the nonexistence of longitudinal data that captures how the levels of living standards of people living with impairments changes over time.

Some studies in LA have described the characteristics of people with disabilities, finding that this group share similar characteristics between countries: they are poor, have low levels of education, live in marginalized regions, have low access to health care services, are unemployed or working without earning a salary (Buvinic et al., 2004, Economic Commission for Latin America and the Caribbean (ECLAC), 2013, Mitra et al., 2011, Samaniego, 2006).

Although in LA some studies on this topic have been conducted; a detailed analysis of the levels of poverty of people with disabilities in the region is yet to be performed. Aiming to fill this gap of knowledge and recognising the difficulties and limitations of analysing the relationship between disability and poverty only with observational data, this research aims to study the effect of disability on levels of poverty of households in LA. Such analysis has not yet been systematically addressed and the results of this study will provide important empirical evidence on the analysis of this relationship in LA as a developing region.

1. RESEARCH QUESTIONS

In order to contribute to the analysis of the relationship between disability and poverty and contribute to the knowledge of the levels of poverty of households with disabled members in LA, this study aims to answer a primary research question are:

How does the presence of a disabled person in a household impact on the risk of poverty in a sample of Latin American countries?

In order to answer this question, four more specific research questions were proposed in this study, they are:

1) What are the main characteristics of households with members with disability in different LA countries?

2) How does the risk of poverty change (increase/decrease) according to the type of measure of poverty that is used?

3) How much has the risk of poverty of households with disabled members changed in the last decade in 3 LA countries?

4) Using a multidimensional measure of poverty, what are the main deprivations of households with disabled members in LA countries?

Further: How do those differ between countries?: and how much do households with disabled members contribute to the national multidimensional poverty rate?

In seeking answers to the research questions proposed in this study a small-N comparative variable-oriented design using most-different cases and a cross-sectional design were implemented. This study is based on a post-positivism ontological perspective, assuming the existence of a reality that can be measured (Lincoln and Guba, 2000). The logic of inquiry follows a hypothetico-deductive analysis and aims to test the hypothesis *households with disabled members have a higher risk of poverty compared with households without disabled members.* This hypothesis is tested in different contexts and times, aiming to generalize the results of this research to other countries in LA.

Cases were selected using a three step selection process: 1. countries that fulfilled four criteria related to socioeconomic and human development were selected; 2. countries that included questions on disability in their last national censuses and 3. countries that asked disability questions to individuals and not households were selected. At the end of the process five countries were selected: Brazil, Chile, Colombia, Costa Rica and Mexico. The countries included represent (around) 64% of the total population in LA. Given the different characteristics and histories of each country, the group is heterogeneous and represents to some extent the reality of LA as a region. Nevertheless, low income countries in the region were not included in the analysis, as a result of data limitations.

Two sources of secondary data were used: Population Censuses and National Household Surveys. The first source of data was used mainly for the comparative analysis of the levels of poverty of households with and without disability in LA. National Household Surveys are used in the cross-sectional study. Only in the case of Costa Rica, the census was used as source of information for the cross-sectional analysis.

This thesis is divided in two main parts, first a cross-sectional study is implemented aiming to examine and to describe the characteristics of people with disabilities and their families in LA, and using objective and subjective measures of poverty changes in the risks of poverty of households with disabled members were measured. The second part aims to compare the levels of multidimensional poverty of households with disabled members in the five LA countries. In this part,

a multidimensional measure of poverty following the Alkire-Foster methodology is implemented and the levels of poverty between countries are compared.

The study reveals that there is a positive association between disability and poverty in the five LA countries. The direction of this association does not change according to the type of measures of poverty (direct and indirect) and in general households with at least one member with disability had a higher probability of being classified as poor or have a lower monthly household income compared with households without disabled members. In the case of multidimensional poverty, it was found that in the five LA counties analysed, households with disabled members always had higher levels of multidimensional poverty, compared with households without disabled members. The levels of deprivation of these households were higher, and even when a dimension did not have an important contribution to the national multidimensional poverty, it had a major contribution for households with disabled members.

The results from this study provide empirical evidence of the levels of poverty of households with disabled members in LA. In this context, it is important to realise that disability cannot be considered an individual and static problem, but it should be considered as a social construction and aspects related to social justice and how governments respond to the needs of people with disabilities become a priority for the analysis. Indeed, it is important to understand disability as part of human diversity, and legislation on this topic should aim to guarantee equality of access to opportunities and services and to protect their human rights, all this aiming to

provide the conditions for individuals to choose the lives they value and want to live.

The difficulties of conducting comparative research in the case of disability and poverty were recognised by the researcher. Both concepts have multiple definitions and questions that respond to each definition capture a different set of the population, therefore when a comparative research design is implemented it is important to highlight the possible consequences of these aspects and structure the research in a way that aims to reduce those differences and analyse the same problem. This study compares the levels of multidimensional poverty of households with and without disabled members in five LA countries. In order to capture the same phenomena in each country the household was selected as the unit of analysis and a multidimensional poverty index using the same indicators, weights and cut off was implemented for each country. The proper operationalization of concepts and the use of the same index reduced the sources of bias and allowed a proper comparative analysis.

2. LANGUAGE

This thesis uses the terms people with disabilities and disabled people interchangeably. The author recognises that in the United Kingdom (UK) the term *disabled people* is used and it is associated with the social model of disability, she also recognises that the concept *people with disabilities* is commonly used in other countries, especially in LA and it responds to a perspective of disability based on the social model and on the model proposed by the WHO. In this context, both

concepts respond to similar understandings of disability and as a result are used interchangeably in this document.

3. Structure of the thesis

This document has eleven chapters. The first has the aim to provide a summary of the rationale for this study and to introduce the most important issues for consideration. The second chapter has as objective to present a general description of the concepts of poverty, inequality, social exclusion, vulnerability and chronic poverty. The proper understanding of these concepts becomes fundamental for the analysis of the relationship between disability and poverty, especially when this relationship is seen as the result of complex situations that effect individuals with disability and their families.

The third chapter discusses the most relevant theoretical models to define and to understand disability. This chapter provides the general context of how disability is defined and measured and how the WHO and the UN have influenced the way governments in LA have included people with disability in their legislation. The fourth chapter aims to explore in detail how the concepts of disability and poverty are related. It analyses the bi-directionality of this relationship, indeed each of the directions of the relationship (from poverty to disability and from disability to poverty) is analysed in detail. The fifth chapter offers a description of the context of LA as a region and provides a general background of what socioeconomic conditions make the region an interesting case to analyse the relationship between disability and poverty.

Chapter six has as objective to present a summary of the methodology used in this study, with a description of the research design and the selection of the cases and sources of information. Chapter seven presents the main methods used in the cross-sectional analysis and provides a description of the characteristics of people with disabilities in the five LA countries included in this study. Chapter eight presents the results of the cross-sectional analysis in each country and year; the results of this chapter seek to answer the second and third research questions of this study. The ninth chapter takes the analysis a step forward by comparing the levels of multidimensional poverty in households with and without disabled members in the five countries included in this study. The tenth chapter discusses the findings of both analysis and their policy implications in LA. This chapter also presents a discussion of methodological implications of conducting comparative research on disability and poverty and if it is possible to make causality claims when observational data is used.

Finally, chapter eleven summarizes the key findings of the research, presents the significance of this finding, reflects on the methodological process and identifies limitations and the contributions of the results to the understanding of the relationship between disability and poverty in LA.

CHAPTER 2

POVERTY, INEQUALITY AND SOCIAL EXCLUSION

1. INTRODUCTION

The objective of this chapter is to present a discussion of the concepts of poverty, inequality, social exclusion, vulnerability and chronic poverty. The proper understanding of these concepts is fundamental for the analysis of the relationship between disability and poverty, especially when this relationship is seen as the result of complex situations that affect not only individuals with a disability but also their families.

Poverty is a global problem, which affects thousands of people around the world. Although it has been recognized as a social problem in most countries, the definition of poverty differs between countries and the study of this condition as a process has been limited by the lack of longitudinal data.

As will be examined in this chapter, two main methods to measure poverty can be found in the literature (Ringen, 1988). On the one hand is the indirect or income method; which defines poor populations as those who have a level of income lower than an established minimum. On the other hand, is the direct method to measure poverty, which uses multidimensional or non-income measures of poverty, including aspects related to health, education, labour and participation in the analysis and understands poverty as a complex and multidimensional situation. The Unsatisfied Basic Needs (UBN) and the Capability Approach (CA) are two

examples of theoretical perspectives that use the direct method to measure poverty (Lister, 2004, Sen, 2000).

Different measures of poverty have been proposed in the literature (Haughton and Khandker, 2009). However, following direct and indirect methods, two main methodologies exist. The income approach only include the analysis of one dimension, the most common being either income, consumption or expenditures. The poverty line is the most used type of measure and it defines a minimum level of income per day or month. The levels of income vary between countries and regions, and poverty lines can measure absolute or relative poverty depending on what poverty line is used for the analysis (Ravallion, 1998). The direct approach includes multidimensional analysis of poverty, with the human development index (HDI) and the multidimensional poverty index (MPI) as some examples. One relevant aspect is how dimensions are selected to be included in the index, in some cases participatory methods are implemented aiming to reflect the reality of a country (Alkire, 2007a).

Some individual, family and regional characteristics have been recognised as factors that increase the risk of becoming poor. Some examples are: sex, age, ethnicity, region of residence, levels of parental education and having low levels of assets. All of these characteristics increase the vulnerability to poverty of individuals and households and are highly associated with being chronically poor (Chronic Poverty Advisory Network, 2014).

When poverty is defined in relative terms, the unequal distribution of resources in a society plays a more relevant role (Sen, 1983a). Indeed, inequalities between

different populations affect the levels of vulnerability for certain groups in a society. Furthermore, the triangular relationship between poverty-inequality-growth has been one of the reasons why economic growth has not reached poor individuals and why strategies to reduce poverty have not had the expected effect.

Other important concepts in the analysis of poverty are social exclusion and vulnerability. Both concepts are related to a multidimensional approach of poverty, where poverty is not only related to lack of income, but also being deprived in basic indicators (e.g. access to a source of clean water, sanitation and nutrition). Social exclusion is the result of a lack of opportunities to participate in a society. Usually being excluded from employment opportunities and facing barriers of access to basic services, such as education and health, are major areas where poor populations face social exclusion. Vulnerability is associated with the risk of becoming poor and chronically poor. In general, poor and chronically poor individuals have similar characteristics that make them vulnerable and those characteristics are sources of social discrimination and exclusion. Some examples of these are sex, age, ethnic group, illness and region or geographic area.

This chapter is divided into eight sections including this introduction. The next section presents different definitions and understandings of poverty. Then, the most influential methodologies to measure poverty are discussed, followed by a brief presentation of the main characteristics of poor populations and a discussion of the relationship between poverty and inequality. The concepts of social exclusion, vulnerability and chronic poverty are then briefly analysed and then the chapter concludes.

2. POVERTY: THEORIES AND DEFINITIONS

Poverty is a concept with multiple definitions, which has been defined from different perspectives and theories. Nevertheless, the concept has usually been related to *not having enough*… or *living with less than a minimum level of*... In this context, the definition of poverty is directly associated with the way it is measured. The literature on poverty is extensive and diverse, however, the understanding about this category at some point is reduced to what dimensions are fundamental or vital for human beings and in what contexts. One example is the definition proposed by Ravallion (1992) that says "*poverty can be said to exist in a given society when one or more persons do not attain a level of material well-being deemed to constitute a reasonable minimum by the standards of the society*" (p.4). This definition of poverty establishes that poverty is related to reaching a minimum level of material well-being that is defined inside a society.

Additionally, Sen (1983b p. 9) defines " '*the poor' are those people whose consumption standards fall short of the norms, or whose incomes lie below that line*" (p.9). Under this definition, similar to the one proposed by Ravallion, to be poor or not depends on the levels of consumption or income in a specific society. When contextual aspects are included in the analysis, the differentiation between absolute or relative poverty becomes a critical point. On the one hand, absolute poverty is the lack of sufficient income or resources to meet basic physical needs (Lister, 2004). This concept is understood in terms of survival and in most cases absolute measures aim to capture an extreme level of deprivation. On the other hand, relative poverty is directly associated with the context within which the

person lives (Lister, 2004). Under this perspective, the definition of the minimum level depends on the society and usually is established in each country. One of the most well-known examples is the relative poverty line used by most European countries, where a person is considered poor if s/he lives with less than 60% of the median income (Lister, 2004).

Theoretical perspectives to understand poverty and deprivation play a major and fundamental role in which dimensions and indicators are considered by the analysis. Two important examples are the UBN and the CA. The objective of UBN is to identify a set of basic services and goods that are necessary to sustain a minimum level of life and that should be used by the whole population. Under this perspective poverty is understood as the lack of access to basic services and goods. By contrast, the CA defines poverty as a capability failure that reduces the set of choices that a person has (Sen, 1976). This approach emphasizes the importance of freedom for the achieving of a set of functionings[1] or the lives s/he wants to live (Alkire, 2002, 2005a, b, Wong, 2012).

The level of analysis of poverty plays an important role in the definition of who is poor or not poor. Indeed, definitions of poverty under the UBN approach, considers the household as the unit of analysis and assumes that the levels of deprivation of some individuals in a household affect all members in the same way. In this case, intra-household distributions, quality of services and effective use of such services are not considered (Stewart, 1989, Wong, 2012). The CA can assume

[1] Functionings refer to what a person actually manages to do or be (Lister, 2004). Capabilities are associated with what a person can do or be and with the range of choice open to her. In this context, it is related to the freedom to achieve a valuable functioning. In addition, freedom is the opportunity to fulfil what the person values (Alkire, 2005b)

an individual or a household perspective, this depends on the objective and type of indicators included in the analysis (Lister, 2004).

It is important to recognise differences between poverty and deprivation. Townsend (1987) defines deprivation as the lack of different resources, opportunities or conditions that are available in a society. For this author, poverty is a situation when resources and conditions to live in a society are denied to a person; as a result s/he is unable to fully participate. This distinction between these two concepts recognises that poverty is a complex situation not only related to lack of resources, but also to social exclusion and rights.

In conclusion, poverty is a concept that is usually used in the literature but is sometimes ill-defined. How poverty is defined is associated with the way it is measured and with the number of dimensions or domains that are included in the measurement process. Monetary or income approaches define poor people as the group of the population, whose income or consumption does not reach minimum levels. However, in this case poor people are considered as a group of individuals with similar characteristics, ignoring individual realities and that poverty is a condition that effects other dimensions of well-being not just income.

3. MEASUREMENT OF POVERTY

Different types of methods have been proposed to measure poverty. However, two are the most important: the direct and the indirect or income method (Alkire and Santos, 2014, Ringen, 1988, Sen, 1979). The first method is based on approaches that recognise poverty as a complex situation not only related to income or

consumption. By contrast, the indirect method aims to determine if a person falls below a poverty line and is based on a monetary perspective of poverty (Alkire and Santos, 2013a, Sen, 1983b).

Sen (1976) proposed two basic steps that a measure of poverty should have: *identification* of who the poor are and *aggregation* in a unique numerical measure of those who are poor. To satisfy these two steps, it is important to define what dimensions are significant in the definition and measurement of poverty. The indirect or income method usually enlists poverty lines as its main instrument of measure; under this perspective, people living with a level of income or consumption lower than an establish poverty line are considered poor.

Ravallion (1998) defines poverty lines as "*the monetary cost to a given person, at a given place and time, of a reference level of welfare. People who do not attain that level of welfare are deemed poor, and those who do are not*" (p.3). In this context, a poverty line classifies people into two groups: poor and non-poor, and this division is done according to a specific threshold. Poverty lines are an important tool when poverty comparisons are conducted, these measures allow the analysis of changes across time and between and within countries, also, they are easier to construct that other indicators (Ravallion, 1992). The poverty line proposed by the WB measures absolute poverty and allows comparisons between countries (Alkire and Santos, 2013b, Ravallion, 1998).

Three methodologies have been proposed to create poverty lines: cost of basic needs, food energy intake and subjective evaluations. The first method is the most commonly used, it estimates the cost of acquiring a basic basket of food that covers

the minimum caloric intake (usually 2,100 calories per person per day) and adds the basic cost of clothes and shelter. The food energy intake is used when price information is not available; it determines the level of income that a family or a household spends on food and defines poor populations according to this aspect. Finally, subjective poverty lines are based on what a person believes should be a minimum level of income to satisfy his or her basic needs (Haughton and Khandker, 2009).

Two popular measures of poverty are the headcount measure (H) and the poverty gap (G). *H* measures the proportion of the population under the poverty line and *G* measures the distances between individual income and the poverty line. The two indicators have been criticized, mainly because *H* does not provided information about how poor the poor are and *G* does not consider transfers among the poor (Deneulin and Shahani, 2009, Sen, 1979). Other indices can be found in relevant literature; some have the purpose to measure poverty but consider transferability and monotonicity properties, one example is the *Sen poverty index* that includes parameters related to income and income distribution. Its main purpose is to analyse three effects: i) the number of poor, ii) the depth of their poverty and iii) the distribution of poverty (Haughton and Khandker, 2009).

One desirable property of a measure of poverty is *additively decomposability*. This property allows the analysis of subgroup poverty and how much each group contributes to the final poverty rate in a society. The Foster, Greer and Thorbecke (FGT) measures are poverty measures that are additively decomposable and associate a measure of inequality. These measures can be seen as the combination

of *H, G* and an inequality measure and have been used in order to analyse poverty and inequality between different groups in a society (Foster, 1984).

Measures under the direct approach include more than one dimension in the analysis and aim to identify individuals that cannot meet a minimum level of needs. Each dimension included in a direct measure represents one aspect (need) that should be covered in order to reach a certain standard of living (Alkire and Foster, 2011b, Sen, 1983b). Two of the most important examples of multidimensional indices are the HDI, which includes three dimensions of development (health, education and income) and the MPI, whose main purpose is to measure acute poverty (Alkire and Foster, 2011a, b, Alkire and Santos, 2010, 2013b). The selection of dimensions and weights of each indicator depends on the main objective of the measure; in cases where the poverty measure is context based, normative decision becomes one of the most fundamental steps on the measure of poverty (Alkire, 2007a).

The MPI is based on the Alkire-Foster methodology. This methodology links the counting approach with an axiomatic approach. In addition, it uses a double-cut off approach to identify individuals who are deprived in certain dimensions and who are multidimensional poor. In general, the methodology follows a certain number of steps that allow the identification of the poor and the aggregation of them in a main index (Alkire, 2007b). Chapter 9 presents a detailed discussion of multidimensional measures of poverty prior to undertaking the analysis.

As a result of the large number of measures of poverty and their characteristics, the population that each of them captures is different. Szekely et al. (2000)

analysed why the levels of poverty differed between studies, even when they used the same source of data and concludes that the levels of poverty depended on the assumptions made about consumption behaviours within household; the choices of equivalence scales and whether missing and zero values were included or not in the analysis. Additionally, Ruggeri et al. (2003) reviewed four different approaches to measure poverty (monetary, capability, social exclusion and participatory approaches) and concluded that based on the assumptions that each approach had and how concepts were operationalized, the number of people identified as poor by each approach was different, more startlingly, sometimes they do not overlap.

In conclusion, two steps should be followed in order to measure poverty: identification and aggregation. Indirect and direct methods are used to identify who the poor are. The indirect or income method identifies those individuals whose actual income does not reach a poverty line. The direct method understands poverty from a multidimensional perspective, including more than one dimension into the analysis and aims to identify those individuals who fail to cover an accepted level of needs. As considered here, the most well-known and used measures of poverty are the head-count (H) and the poverty gap (G). They have been highly criticized and other measures have been proposed in the literature, some examples are the *Sen poverty index* and *FGT* measures. Finally, we can see it is important to recognise that different measures of poverty capture different populations and that each measure responds to different understandings of poverty.

4. WHO ARE THE POOR?

Poverty is recognised as a major social problem around the world. Developed and developing countries present to some extent a percentage of population living under a certain level of welfare. Poor individuals do not belong to a homogeneous group; their experiences of poverty depend on socioeconomic, family and personal characteristics.

Poverty is a dynamic process that affects diverse groups in different ways. The duration and severity of this situation varies between individuals, households, regions and countries. Although, the proportion of the population considered as chronically poor is relatively small compared to the total percentage of poor individuals, poor individuals face high levels of deprivations and cannot cover their basic human needs (Bane and Ellwood, 1986, Chronic Poverty Research Centre (CPRC), 2005, Huff Stevens, 1994, Hulme and Shepherd, 2003).

Individual and family characteristics have been identified as factors that facilitate or increase the risk of poverty. The feminization of poverty (Pearce, 1978) has been recognized by different studies using data from the North and the South. The number of households in poverty headed by females is higher than households in poverty headed by males. Gender discrimination inside and outside households, economic dependency and self-sacrifice are some of the main causes of the higher proportion of women in poverty (Lipton and Ravallion, 2008, Lister, 2004). Additionally, ethnicity is another individual characteristic related to poverty. As in the case of gender, discrimination and stigma are two main reasons for the increase in the risk of poverty for different ethnic groups (Pager, 2006) Finally,

individuals with high levels of dependency such as children, elderly and people with disabilities face higher levels of poverty related to the extra economic and opportunity costs and to a reduction in the number of household members working and earning an income (Lister, 2004, Spicker, 1993).

Rural areas have higher rates of poverty. In most cases, people living in rural areas have lower levels of education, agricultural activities are usually their main source of income and food production and in some cases the production only covers family consumption. The number of health and education services in rural areas is lower compared to urban areas; an aspect that has a direct impact on individual levels of human capital and effects their future opportunities (CPRC, 2005, Lister, 2004, WB, 1990).

Access to financial and material assets is also fundamental in the analysis of poverty (Shapiro and Wolff, 2005). In most cases, poor individuals have restricted access to human, physical and capital assets limiting the number of available options a household has to mitigate or overcome the negative effect of different shocks that increase their risk of poverty.

Poor households are often characterized by their large size, a high number of children and elderly members. Furthermore, usually the head of the household is female, has low levels of educational qualification or experience and works in the agricultural or the manual sector. Most members work in the informal sector, therefore in countries with limited social protection systems, they do not have access to health care or pensions (Calvo and Dercon, 2005, Carter and Barrett, 2006, CPRC, 2005, Spicker, 1993).

Low levels of education and higher risks of disease and illness are two main characteristics of poor individuals. As a consequence, the access to labour opportunities is effected by their low level of human capital. In addition, lack of access to preventive and curative health care services increases the risk of becoming chronically ill or a premature death; the situation has been recognised as a significant facilitator to falls in poverty or extreme poverty (CPRC, 2005, Hulme and Shepherd, 2003, 2001, WB, 1990).

Different studies have identified the bidirectional relationship between health and poverty. Sala-I-Martin (2005) proposes six channels that increase the risk of poor health for poor populations. Those channels are related to lack of access to health care services and medicines; bad sanitation services (water or sewerage); higher economic and time costs to access health care services and un-healthy sexual behaviours. In this context, access to health care services is a determinant in the process of becoming poor. Disease and high costs of health care are two main factors that increase the risk of poverty and more importantly of becoming chronically poor (Krishna, 2011).

Recently the distribution of poor populations around the world has changed. It has been recognized that the majority of poor people in the world live in middle income countries (MIC). China and India are the countries with the highest percentage of poor individuals. However, the poorest of the poor are still living in countries in the Sub-Saharan Africa (Alkire et al., 2013b, Sumner, 2012). Poverty in MIC is associated with distribution or resources (inequality) and with levels of democracy and economic growth. Indeed, the lack of economic resources is not the

main cause of poverty in MIC; the unequal distribution of basic resources and opportunities has been recognised as the major source of poverty (Alkire et al., 2013b, Sumner, 2012).

In conclusion, poor households usually have similar characteristics, those are related to: having a female-heads; household members with low levels of human capital; low levels of material and financial assets; living in rural areas and being part of an ethnic minority. In addition, in recent years the distribution of the poor around the globe has changed. Indeed, currently the majority of poor individuals live in MIC and in these countries, poverty is not only related to access to a minimum level of services or income, but also with the distribution of resources (inequality).

5. POVERTY AND INEQUALITY

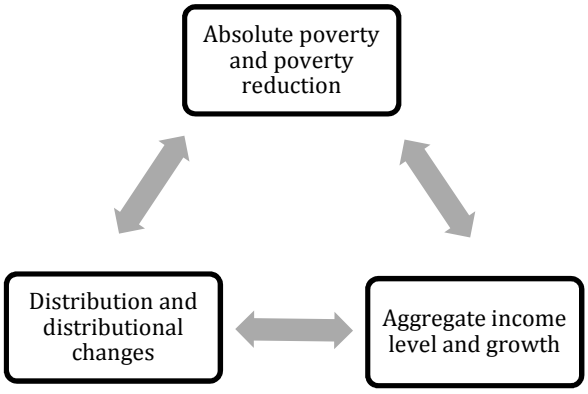
Poverty and inequality are two related concepts. Indeed, problems related to distribution of resources inside a population increase the severity of poverty and the number of available opportunities to overcome this situation. In addition, when poverty is understood as the level of deprivation or achievement of a person compared to others, it can be defined as "*an issue of inequality*" in the distribution of resources in a society (Sen, 1983a).

Inequality is related to the distribution of resources in a society and how this distribution is unfair for some groups. It can be defined as absolute or relative. The first represents the absolute difference in the levels of living and relative inequality is related to income differences between individuals (Ravallion, 2005). Both views

of inequality are significant in the analysis of how economic growth has a positive (negative) impact, on poverty reduction.

The Kuznets Hypothesis proposes that levels of relative inequality will increase in early stages of growth, but shortly they will decrease; aspects that will allow for redistribution and poverty reduction in developing countries (Ravallion, 2005). Nevertheless, the interaction between poverty-growth-inequality has played a major role in how resources are distributed within the population and how economic growth reaches the poorest individuals in a society (Figure 2.1) (Bourguignon, 2004, Francisco H.G. Ferreira and Ravallion, 2009).

FIGURE 2. 1. POVERTY-GROWTH-INEQUALITY TRIANGLE



Reproduction from: Bourguignon (2004)

The analysis of the impact of economic growth on the increase of levels of income for poor populations revealed that growth does not affect poor and rich households equally. Indeed, even when the income of poor households increases, the proportion of the increase in income for rich households is usually higher. In other words, economic growth has a limited influence on the levels of poverty of

the population, especially in countries with high levels of income inequality and precarious welfare systems (Ravallion, 2001).

Inequality between groups increases the risks of poverty of certain populations within the society. In fact, unequal distribution of resources and opportunities is a major factor that increases the severity and duration of poverty. Inequality between groups depends on three main aspects: i) differences between average income of the groups; ii) number of groups in a society and iii) size of each group (Elbers et al., 2008). It is also related to poverty in the way that each group has access to social and economic opportunities in different proportions. The difficulties they face depend on distinctive features such as sex, age, ethnicity, disability and family background (Jordan, 1995); characteristics that are sources of social division and social stratification within societies.

The unequal distribution of resources between groups in a society, create vicious cycles of poverty and social exclusion. In this context, individuals who are marginalized and excluded from basic opportunities have lower chances to prevent and overcome poverty, creating a vicious cycle between poverty, social exclusion and inequality.

The analysis of poverty is incomplete when aspects related to; inequality, social exclusion and vulnerability are ignored. Indeed, the risk of poverty increases when a person faces high levels of social exclusion; belongs to a vulnerable group, and, as a result of unjust distribution of opportunities cannot have access to services that will provide the basic tools to overcome poverty.

In conclusion, poverty and inequality are related in several aspects. Two aspects are relevant in the analysis of poverty and disability; first the levels of inequality directly affect how economic growth redistributes between the whole population, and second group inequalities in a society determine how resources are available for certain groups, including people with disabilities.

6. Social Exclusion

Social exclusion is a complex concept that covers economic, social and political aspects. It is associated with comparisons between members of a society and with how an individual identifies herself as part of a society (Bossert et al., 2004). According to Sen (2000), social exclusion is related to poverty if it is understood as a capability failure; given that "*social exclusion can, thus, be constitutively a part of capability deprivation as well as instrumentally a cause of diverse capability failures*" (p.5). In this context, social exclusion becomes an important category for the study of poverty.

Social exclusion has been defined from different perspectives, some of which relate to access to social protection whilst others relate to social participation. The first definition of social exclusion was proposed by Lenoir in 1974, who defined the excluded as those who were outside the social protection system, such as mentally and physical handicapped, abused children, delinquents, single parents and others (Bhalla and Lapeyre, 1999, Rodges et al., 1995, Sen, 2000). Other definitions include aspects related to social relationships; social participation; human rights and citizenship. However, social exclusion is still a misunderstood concept, but in

general it is associated with social disadvantage of one group in relation with others in a society (Jordan, 1995, Rodges et al., 1995).

In addition, social exclusion can be defined as the result of the interaction between three aspects: (1) an individual who belongs to a society; (2) reasons outside the individual's control that prevent her to participate in normal activities and (3) the willingness to participate (Burchardt et al., 1999). In this definition, participation and social barriers are two main aspects that determine who the excluded are, and the difference between voluntary and involuntary exclusion. Indeed, individuals who do not want to participate and exclude themselves from normal social activities should not be considered as excluded, since it was a personal decision (Barry, 2002, Sen, 2000).

The characteristics of the labour market play a significant role in the definition of who are the socially excluded (Barry, 2002). The flexibilization of labour markets has increased the risk of long term unemployment and of having a reduced number of labour opportunities. Moreover, formal employment increases the number and the type of social relationships and networks a person can create, which has a direct effect on the type of available opportunities for each individual. Additionally, family and personal income depends directly on access to labour. Therefore, individuals excluded from employment have lower levels of income, with a negative effect on their levels of consumption of basic goods and services (Bhalla and Lapeyre, 1999, Rodges et al., 1995).

In addition, individual levels of human capital are determined by access to health and education services. Access to education becomes a determinant for future

labour opportunities and salaries, and access to health care services decreases risks of illness and diseases, and prevents extra medical costs that can create poverty traps (Rodges et al., 1995, Saith, 2001, Sen, 2000).

Socially excluded individuals face incomplete citizenship. In this case, being excluded is related to not having citizenship rights recognised or having no guarantee of human rights being protected and upheld. Political and social participation are limited and socially excluded groups usually do not participate in democratic processes that are a determinant for the recognition of their citizenship. Anti-discrimination policies aim to guarantee equal access to basic opportunities and to protect the human rights of vulnerable and usually excluded groups in a society (Hills et al., 2002, Jordan, 1995, Rodges et al., 1995, Sen, 2000).

Social justice and equal opportunities play a major role in the study of social exclusion. According to Roemer (1998), equal opportunities should be distributed according to levels of individual effort and should not be related to personal characteristics outside of individual control. Indeed, if the distribution of opportunities is based on these characteristics, it should be considered as unfair. In most societies, social class and family background affect the type of opportunities to which a person has access. The set of available opportunities for poor individuals is small and usually the quality of services is questionable. Additionally, the number of education and health care services in rural or remote areas is lower, aspects that increases the risk of chronic poverty for poor individuals living in these areas (Barry, 2002).

Following the definition of the excluded as *those who do not have access to the Welfare State,* access to the formal market or to different social assistance programmes becomes fundamental. In this case, Saith (2001) analyses that exclusion from the welfare state in developing countries cannot be studied as in developed countries, given that in the first group usually social protection systems are design to cover formal workers, ignoring that a high percentage of the population actually work in the informal sector. In fact, the author proposes an analysis based on the access to *promotive social security*, which include actions and strategies to reduce chronic deprivation in health, education and nutrition (Saith, 2001).

Under a multidimensional perspective, social exclusion and poverty are directly related. In this context, poverty is seen as a dynamic process that varies between individuals and societies. It is also affected by individual and family characteristics and depends on the interaction with the local community (Hills et al., 2002). When poverty is analysed from a multidimensional perspective, social exclusion becomes relevant in order to define the processes that create a capability failure. Group inequalities and how resources are distributed between groups and regions in a country are also related to social exclusion. Unequal access to opportunities for a specific group and the reduced number of options for social and political participation are characteristics of socially excluded groups with high risks of poverty.

In conclusion, social exclusion can be understood as the result of precarious labour markets and as the lack of opportunities and social relationships. It is related to

poverty when poverty is understood from a multidimensional perspective that considers access not only to income but to other basic opportunities. Individuals excluded from the labour market, basic opportunities and social and political participation have a higher risk of becoming poor or chronically poor, depending on their original position.

7. VULNERABILITY AND CHRONIC POVERTY

When poverty is analysed as a dynamic process, the concepts of vulnerability and chronic poverty become important. In this case, factors associated with risk, duration and severity are relevant and fundamental to the study of poor populations. The WB (2001) defines vulnerability as the measure of resilience against a shock, and how this shock reduces or not the general well-being of the person. In fact, vulnerable populations are those who have weak mechanisms to prevent, mitigate and overcome economic, physical, social, political and environmental risks.

Poverty from a vulnerability perspective is the probability that a family reach a position where it is impossible to cope and overcome any risk. Additionally, the lack of strategies that a family can implement in order to reduce the effect of these risks increases the chances of becoming chronically poor (Hulme et al., 2001, Prowse, 2003). Poor families are constantly facing situations that increase their risk of becoming poorer, including illness, unemployment and environmental change (Dercon, 2006). A decrease in income and consumption intensify a poverty situation and present decisions that can increase future risks, for example taking children out of school.

Becoming chronically poor depends on the frequency, intensity and impact of *shocks* that poor families face. Hulme and Shepherd (2003) define chronic poverty as the situation that "*occurs when an individual experiences significant capability deprivations for a period of five years or more*" (p.405). In this context, the analysis of factors that affect mechanisms to overcome poverty is decisive, especially when poverty is understood and measured from a multidimensional perspective.

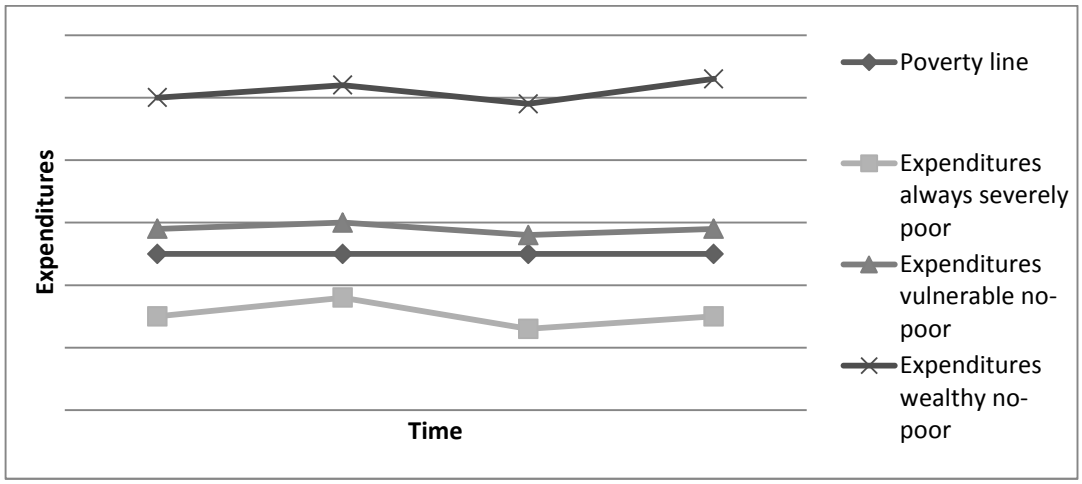
Chronic poverty is an intergenerational problem that affects the individual/household income and number of opportunities household members have. It is associated with low tenure of assets (human, financial and material) and high level of debt; aspects that are transferred between generations. Families who become chronically poor cannot accumulate assets and capabilities; this increases their vulnerable and means they are unable to overcome future risks without becoming poorer. Additionally, families cannot emerge from poverty without State help (Hulme and Shepherd, 2003).

Three main types of risks can explain poverty, two are related to health (child mortality and nutrition levels) and one to agricultural economies (Dercon, 2006). Furthermore, poverty is explained by transitory or permanent effects of the three types of risk. Shocks affecting health and employment are the most relevant for poor families. Indeed, health care payments due to illness and loss of employment for heads of household have been identified as two important sources of vulnerability and causes of extreme and chronic poverty (CPRC, 2005, Hulme and Shepherd, 2003, Prowse, 2003).

The chronically poor face high levels of disadvantage, as a result of their reduced set of opportunities and skills. They are a heterogeneous group, who experience multiple vulnerabilities and deprivations. Personal and social factors such as sex, age, health problems, social position, area of residence, levels of violence and insecurity increase the risks of poverty for those who are vulnerable and socially excluded (Hulme et al., 2001, Hulme and Shepherd, 2003). The chronically poor face the severity of poverty in different proportions and their strategies to cope and to overcome poverty depend on individuals' (household's) initial position.

Chronic poverty is the result of a long duration process and the severity of the problem varies between groups (Figure 2.2). It is an interaction between available resources and time. The levels of poverty of a person or a household in a moment of time depend on the effect of previous shocks, the strategies used to cope and overcome the situation and how those affect the levels of household assets (human, financial or material). From a multidimensional perspective, chronic poverty is related to income and consumption, access to basic opportunities and how households and individuals convert income into instrumental capabilities (Hulme et al., 2001, Sen, 2000).

FIGURE 2. 2. CATEGORIES OF POOR ACCORDING TO SEVERITY AND DURATION OF POVERTY



Adaptation from Hulme et al. (2001).

The main cause of chronic poverty is to face continuous economic, social, political, environmental and health risks. Economic risks include low levels of productivity, lack of skills, price fluctuations and unemployment. Some examples of social risks are discrimination, inequality and reduced social capital. Moreover, political risks are associated with bad governance, insecurity and violence. Environmental risks are low quality natural resources, environmental degradation, disasters and propensity for disease. Finally, health risks include exposure to disease and high health care costs (Hulme et al., 2001, Prowse, 2003). Poor individuals are constantly facing individual risks, but in situations when different sources of risks interact, the probability of falling in a poverty trap increases.

In conclusion, certain groups in the population have higher levels of vulnerability to poverty reducing their strategies to cope and overcome risks. This increases the severity and duration of poverty, making them chronically poor. In addition, chronic poverty is a dynamic process that is affected by past and present decisions and has an effect on future available resources. In this context, chronic poverty is

an intergenerational problem. Given the complexity of this situation an analysis from a multidimensional perspective will allow a better understanding of what the main sources of risks are, what strategies poor and non-poor households use to overcome those risks and how present decisions affect the level of assets (human, financial and material) a person and a household has.

8. CONCLUSIONS

Poverty is a concept related to the lack of resources and opportunities that a person has. We have seen it is a dynamic process that affects groups at different levels with certain characteristics. In this context, individual, family and sociodemographic factors play a major role in the vulnerability for poverty that specific groups face. This situation is also associated with inequality and social exclusion. Indeed, poor populations are usually excluded from basic social services and opportunities.

The dynamics of poverty involve complex interactions between individual factors and social exclusion processes. Aspects related to vulnerability and chronic poverty become fundamental for the analysis, given that poverty is not seen as a static situation that a person or a family face for a period, but as a process that is transmitted from one generation to the next.

In the context of disability, inequality of income and opportunities, social exclusion and vulnerability play a major role in the definition of what is disability and how this condition is related to poverty. The next chapter discusses in detail the definitions and understandings of disability and how it is measured and it provides

insights into how disability is associated with social, economic and environmental barriers that increase the risk of poverty for individuals living with different impairments.

CHAPTER 3

DISABILITY AS A SOCIAL PROBLEM

1. INTRODUCTION

This chapter presents the most relevant theoretical models to define and understand disability. It also discusses the implications that international documents /reports have had in the way governments define disability in their legislation, the possible implications of those definitions and how different understandings of disability in LA have led to different governmental responses.

Multiple definitions of disability can be found in the literature (Altman, 2001a). The understanding of disability has passed from an individual perspective, where aspects related to handicap and inability to participate in the labour market were the central tenets, to a social and more holistic perspective, where society plays a fundamental role in the creation of disability.

Although, this chapter does not aim to make a detailed historical description of disability, it is important to recognise that people with disabilities have existed since the beginning of humankind. Before the industrialization era, participation in the labour market did not define the role a person played in society. After industrialization, social roles were established according to the economic activity of each person. Under this context, disability was associated with being unable to actively participate in the labour market and deserving of help (Barnes and Mercer, 2003, Finkelstein, 1980, Oliver and Barnes, 2012).

Three main models to define disability can be found in the literature. The first is the individual model, which defines disability as an individual problem, the result of an impairment that limits an individual's ability to participate in the labour market. Under this model, a person with disability does not fulfil social standards, therefore s/he cannot work or be an active member of society (Barnes and Mercer, 2003, 2011, Oliver and Barnes, 2012). The individual model is based on a needs-based approach which established that welfare providers (States, church, charities) should provide social services to specific groups, those who were seen as not able to participate as active members of the society.

The second model developed to support an understanding of disability is the social model. This model assumes disability is socially constructed; it gives an active role to society in the creation of disability. Under this model, social changes should occur in order to guarantee the full participation of people with disabilities. Indeed, legislation and social policies on disability aim to guarantee equal access to basic opportunities and services and to reduce discrimination (Oliver, 2009). The social model is based on a rights-based approach that considers that social policies should guarantee human rights to all members of a society (Lang, 2009). Table 3.1 presents a summary of the main characteristics of needs-based and rights-based approaches and disability.

TABLE 3. 1. NEEDS-BASED APPROACH AND RIGHTS-BASED APPROACHES

Needs-based approach	Medical model
	Personal tragedy theory
	Normalization
	Capitalism
	Medicalization
	Subsidies: Deserving poor
Rights-based approach	Social model
	Social oppresion theory
	Oppresion
	Post-industrialization
	Social change
	Equality of opportunities; Anti-discrimination legislation

The third model was proposed by the WHO in the ICF (WHO, 2001). The biopsychosocial model or ICF model understands disability as the result of an interaction between a health condition and social barriers. This model has been highly influential at international and national levels. Indeed, the Convention on the Rights of Persons with Disabilities (CRPD) is based on the ICF model; this convention is the first official document that forces signatory states to fulfil a number of objectives in order to include people with disabilities in society. Additionally, the ICF model has also influenced the way disability is measured. In this context, the Washington Group on Disability Statistics (WG) has developed a short set of questions based on the ICF. This set was designed to be included in Censuses or large national surveys.

Countries in LA have responded to the requests made by the UN and the WHO. Indeed, two of the most influential documents in the region were the Standard Rules on the Equalization of Opportunities for People with Disabilities and the CRPD. Most LA countries reacted positively to the promulgation of these two

documents. The legislation on this topic started to include a perspective of equalization of opportunities after 1993 and a human rights perspective after 2008.

This chapter will now explore the most influential models to define disability; then the influence of the United Nations (UN) in the creation of an international policy for people with disabilities will be discussed. The most used instruments to measure disability will be considered, followed by a focussed description of disability in LA.

2. DISABILITY: A CONCEPT WITH MULTIPLE DEFINITIONS

Understandings of disability have changed in the last century, with a major transformation having taken place in the last three decades. Disability passed from being understood solely from an individual model to a social model (Oliver, 1990). Social and economic aspects have influenced how disability is defined and understood in a society. According to Finkelstein (1980), the development of disability as a social problem was related to changes in the productive role of individuals. During the pre-industrial period the main sources of labour were agrarian activities and the role of individuals in a society was established by the ownership of land. However, people with disabilities were segregated, objects of pity and shame, and disability was considered as a misfortune for a family (Barnes and Mercer, 2011).

When industrial capitalism was established as the main economic model around the world, active participation in the labour market became a fundamental aspect

to determine the role of individuals in society. In this case, people with disabilities were excluded from paid work as a result of their impairment (Finkelstein, 1980). This period was characterised by medicalization and institutionalization of disability. Indeed, the existence of medical conditions that limited individual participation in economic activities gave reason to establish medical and rehabilitation services, and to increase the number of hospitals, asylums and other medical institutions. Disability was seen as a personal problem and the main cause of the inability to participate in the labour market (Oliver and Barnes, 2012). During the post-industrial society, attitudes towards people with a disability have played a more significant role in how disability is understood. In this period disability is the result of a society that disables individuals and limits their participation and is not an individual problem (Barnes and Mercer, 2003, 2011, Finkelstein, 1980, Oliver, 2009).

Although multiple models to define disability exist in the literature; still there is not a globally accepted definition (Altman, 2001a, 2014). The lack of a standard definition of what disability is has resulted in problems of measurement. To respond to the need for a standard definition of disability the WHO proposed two classifications. Each of them responded to different models for understanding disability and attempted to include relevant aspects.

Disability can be defined from different perspectives, with differing attributes or characteristics included in each description. Individual, social, ICF and CA models are four relevant models for understanding and defining disability. These models have had a direct effect on the type of social policies and strategies implemented to

include people with disabilities and guarantee their equal access to basic opportunities and services. Although a large number of definitions and models do exist, this chapter will only consider the most important models.

2.1. Individual model of disability

The idea of disability from an individual perspective was born during the industrialization era; during this period, individuals' roles in society were defined according to their participation in the labour market (Barnes and Mercer, 2011, Oliver and Barnes, 2012). An example of individual model thinking is the medical model that defines disability as a personal and individual problem that affects only the individual and in some cases his/her family (Altman, 2001a). The aims of social policies under this model are to give access to medical and rehabilitation services and to provide medical support that a person needs to become productive. This model presents disability as an individual identity, which limits the interaction of person with the environment and the society.

Such individual approaches are based on a personal tragedy understanding, which says that disability is considered a tragic result of an undesirable situation, usually associated with illness and disease (French and Swain, 2004). Disability is seen as a negative relationship between impairment and lack of participation in productive activities. As a result of the negative stereotype, people without impairments assume disability as a personal tragedy that only can be managed using medical treatments and professionally administered therapeutic treatments. It reaffirms that disability is an individual problem, which is an unacceptable situation from a social perspective (Barnes and Mercer, 2003).

People with disability are stigmatized and negatively associated with "normality" parameters established by a society. The levels of stigma faced by a person will depend on the severity and the type of impairment, features that determine to what extent a person is seen as "abnormal" (Barnes and Mercer, 2003, 2011). The main consequences of facing stigma for people with disabilities are discrimination and social exclusion.

The most important critique of this model is the overemphasis it places on the individual. The model establishes that people with disabilities face segregation as a result of their condition. Factors related to social, environmental or attitudinal barriers are ignored. The model also assumes that only medical and professionally administered therapeutic treatments should be offered to people with impairments, in order to help them to reach a normality standard. In this case, medicalization and institutionalization of disability is the main social policy tool; reducing the problem to only the relationship between a person and health care providers (Altman, 2001a, Barnes and Mercer, 2003, Oliver, 1990, 2009).

In conclusion, the individual model reduces disability to an individual problem. Guaranteed access to a level of medical and rehabilitation services is the main social and policy response, with institutionalization as one major tool. There is no association between individuals and their environment and social responsibilities for the creation of disability are ignored (Altman, 2001a, Oliver, 2009). Even though this model is not currently accepted by many disability researchers and it has been strongly criticized by disability activists (Barnes and Mercer, 2003, 2004, 2011, Oliver, 2004, Oliver and Barnes, 2012); the individual model of disability is

still commonly used by physicians and disability is still widely associated with medical problems and personal tragedies.

2.2. SOCIAL MODEL OF DISABILITY

The social model of disability has its origins in the Fundamental Principles of Disability, a document published by the Union of Physically Impaired Against Segregation (UPIAS) in 1976 in the UK. The definition included in the document made a clear distinction between impairment and disability. Impairment was defined as "*lacking of a part or all of a limb, or having a defective limb, organ or mechanism of the body"* (Barnes and Mercer, 2003. p. 11). On the other hand, disability was *"the disadvantage or restriction of activity caused by a contemporary social organization which takes no or little account of people who have physical impairments and thus excludes them from participation in the mainstream of social activities"* (Barnes and Mercer, 2003. p. 11).

Under this model disability is the result of an oppressive process, in part a consequence of stereotypes people without disabilities have as well as aspects of social organisation. Those stereotypes are usually negative and associated with lack of skills, inability to work or participate in economic activities. Additionally, words such as "retard", "crippled" and "moron" are used to describe people with disabilities. The stereotypes are also related to what is expected to be a "normal" individual in an specific context (Abberley, 1987).

The social model establishes that society plays a major role in the creation of disability. Indeed, society generates barriers for people with impairments that

limits their participation and creates disability. In this model, disability is a social creation; it is not only related to impairment, it is a socially created process that limits social participation of people with impairments. The main consequence of oppression and exclusion from basic opportunities that this group face is high levels of poverty (Abberley, 1987, Oliver, 2009).

Access to basic opportunities and services is always reduced for people with impairments. In most cases, the effective use of health care and education services is limited by physical accessibility (transportation and buildings). Negative attitudes towards people with impairments reduce their incentive to participate and creates social exclusion processes that affect individuals and their families (Oliver, 2009).

The social model of disability proposes that major social changes should be implemented in order to socially include disabled people. In this context, social policies aim to change architectural, attitudinal and social barriers, to guarantee access to basic services such as education, labour, health and leisure activities and to reduce and eliminate discrimination (Altman, 2001a, Barnes and Mercer, 2003, 2004, 2011).

The social model developed in the UK emphases the role that the society has in the creation of disability. It assumes that if a society is completely inclusive, disability would not exist. As a consequence of this emphasis, different critiques have been developed; the most important is the lack of influence that impairments have in the definition of disability (Shakespeare, 2006, Shakespeare and Watson, 2002). Indeed, the model ignores the reality of people living with different impairments

and how individual realities play a role in the creation of disability. Another criticism is the inability to include individual characteristics, such as gender, age and ethnicity into the analysis of disability (French and Swain, 2004, Oliver, 2009, Shakespeare, 2006, Shakespeare and Watson, 1997, 2002, Carol Thomas, 2004).

In summary, the social model changed the perception of how disability was defined and understood. It established that economic, political, attitudinal and social barriers play a major role in the construction of disability as a social problem. Under this model, disability is a social construction and strategies to include people with impairments should aim to create social changes.

Table 3.2 presents the main differences between individual and social models and provides the main reasons why the models are opposite views of disability.

TABLE 3. 2. DISABILITY MODELS

Model/Characteristics	**The individual or medical model**	**The social model**
Theory	Personal tragedy theory	Social oppression theory
Level of the problem	Personal problem	Social problem
Cope strategy	Individual treatment	Social action
Cope strategy	Medicalization	Self-help
Main responsible of cope strategies	Professional dominance	Individual and collective responsibility
Identity	Individual identity	Collective identity
Social action	Prejudice	Discrimination
Level of adaptation	Individual adaptation	Social change

Reproduced from Adaptation Oliver (2009)

2.3. WORLD HEALTH ORGANIZATION (WHO): TWO DIFFERENT CLASSIFICATIONS

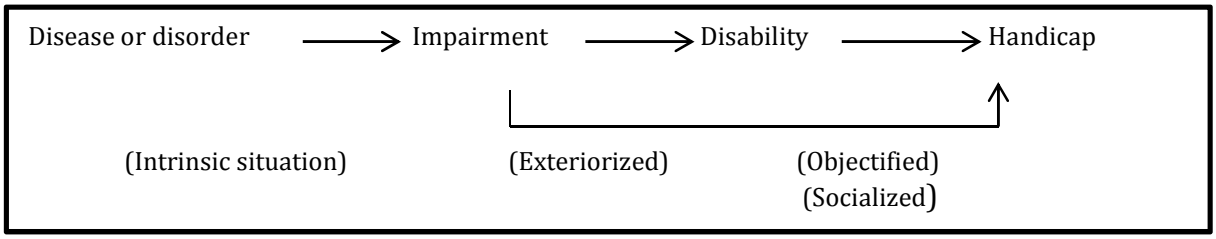
The WHO proposed the International Classification of Impairments, Disabilities and Handicaps (ICIDH) (WHO, 1980) in 1980, aiming to create an universal definition of disability. It was designed to complement the International

Classification of Diseases and included three main components: impairment, disability and handicap.

> *"Impairment.., concerned with abnormalities of body structure and appearance and with organ or system function, resulting from any cause; in principle, impairments represent disturbances at the organ level…*
> *Disabilities…, reflecting the consequences of impairment in terms of functional performance and activity by the individual, disabilities thus represent disturbances at the level of the person…*
> *Handicaps…, concerned with the disadvantage experienced by the individual as a result of impairments and disabilities; handicaps thus reflect interaction with and adaptation to the individual's surrounding"* (WHO, 1980 p. 14).

This classification establishes a linear relationship between impairment, disability and handicap (Figure 3.1). Although, it included social factors in the handicap component, this classification proposed a definition of disability as a restriction to perform activities within a normal range (Barnes and Mercer, 2003).

FIGURE 3. 1. SCHEME OF THE ICIDH



Reproduced from Fougeyrollas and Beauregard (2001)

The ICIDH responded to an individual model of disability. It assumed that people with impairments needed treatment in order to adapt to a society. Although it

considered social aspects, the analysis of disability was limited to individual conditions. The main criticism of this classification was related to the establishment of a normal range, assuming that disability was the result of not being able to do "*normal*" activities. Additionally, the classification assumed that impairment was a cause of disability and handicap, without considering social, economic or other types of barriers that contribute in the creation of disability (Altman, 2001a, Barnes and Mercer, 2003, 2011).

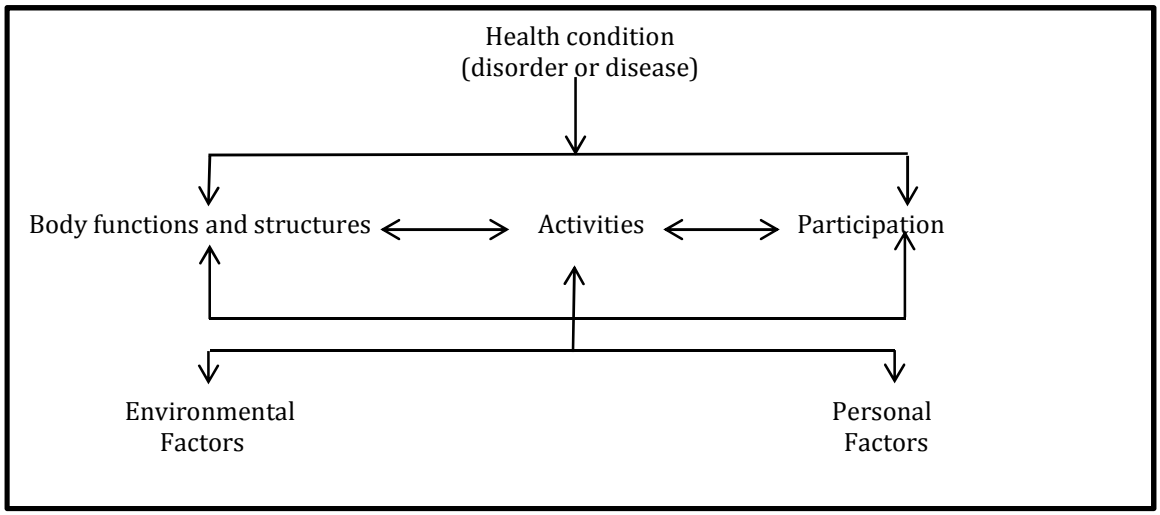
The WHO revised the ICIDH during the 1980s and 1990s and proposed the ICF (WHO, 2001). The revised version responded to the criticism of the ICIDH, included a new perspective to define disability and included social and environmental factors. This ICF proposed a new model to define and understand disability, which included aspects related not only to health conditions, but also to contextual factors.

The ICF defines disability as the result of an interaction between a health condition and contextual and personal factors (WHO, 2001). The classification understands functioning and disability as multidimensional concepts that are related to body functions, activities, participation and environmental factors. It defines impairment as "*problems in body function or structure as a significant deviation or loss"* (WHO, 2001 p. 12) and disability as *"an umbrella term for impairments, activity limitations or participation restrictions"* (WHO, 2001 p. 3).

Given the multidimensionality of disability, the ICF establishes a complex interaction between components (Figure 3.2). It considers the effect of environmental and personal factors on the creation of disability. Indeed, it

identifies that those factors can create barriers in the social inclusion process of disabled people (Fougeyrollas and Beauregard, 2001). The ICF tries to integrate the medical and the social models, in a *biopsychosocial*[2] model that includes elements from both models (WHO, 2001).

FIGURE 3. 2. SCHEME ICF



Reproduced for WHO (2001)

Currently the definition proposed by the ICF is globally accepted, it was included in the CRPD and, based on it, different questionnaires and measures to define disability have been proposed. However, the definition proposed by the ICF has been criticized by groups of disabled activists, given the high emphasis it places on health conditions (Oliver, 2009, Oliver and Barnes, 2012). The major criticisms are the fact that the model arises from a classification of health conditions, its overemphasis on the role of impairment, and social factors are poorly developed.

In summary, the WHO has proposed two different classifications of disability. The ICIDH used an individual perspective of disability, and although it included aspects

[2] The biopsychosocial proposed by the WHO in the ICF, is not the same biopsychosocial used in the UK in health psychology.

related to society, it did not consider the effect of economic, political and social barriers in the creation of disability. In 2001, the ICF was proposed with the objective to establish a common language, allowing comparisons between countries in aspects related to disability. The ICF includes a definition of disability from a *biopsychosocial* model and it contemplates social and environmental factors as fundamental in the creation of barriers for access to basic opportunities and services. Though, currently there is a general agreement to use the ICF definition of disability, it has been criticized by disability activists, given the emphasis that it places on health conditions.

2.4. THE CAPABILITY APPROACH TO DISABILITY

The capability approach, also presents an alternative way to understand disability from a perspective that incorporates aspects related to well-being and social justice. It defines disability as

> "*deprivation in terms of capabilities or functioning that results from the interaction of an individual's (a) personal characteristics (e.g. age, impairment), (b) basket of available goods (assets, income) and (c) environment (social, economic, political, cultural)"* (Mitra, 2006 p. 237).

Disability is an interaction between personal characteristics, environmental factors and availability of certain goods. It is a deprivation "*in terms of functionings (achievements) or capabilities (practical opportunities)*" (Mitra, 2014 p. 24). In other words, people with impairments are deprived in central capabilities, reducing their opportunities to choose the functionings they want. Disability is the result of the interaction between physical, social, economic, political and cultural

barriers that limit access to basic opportunities. Finally, the concept of *"conversion handicap"* makes explicit why people with disabilities face higher risks of poverty compared to people without disability living with the same resources (Sen, 2009). In general, people with health conditions -which do not reduce their sets of capabilities-, have higher risks of becoming disabled, if they develop an impairment as a result of a lack of economic resources (Mitra, 2006).

Economic factors play a fundamental role in the capability approach. Economic deprivations are the consequence of inability to participate in economic activities because of impairments and social barriers (Mitra, 2006). Policy responses to disability should aim to equalize opportunities and to reduce social barriers and economic deprivations. They also need to engage with four levels: 1. Individual; 2. Family; 3. Community and 4. Regional/National. The State ought to present strategies to guarantee access to different commodities for people with disabilities and their families, considering their different needs and contexts (Mitra, 2006, Trani et al., 2011a).

In addition, social policies for people with disabilities should aim to guarantee that each individual reaches a minimum accepted level of capabilities. Social, personal and environmental factors can act as barriers or facilitators in the process of individual development. When these act as facilitators individuals have adequate conditions to choose the capabilities they want and reach the functionings they value. As a consequence of processes of oppression and social exclusion, people with disabilities are deprived from basic opportunities. In this context, social policies for people with disabilities under the CA should consider how to prevent

social, environmental and/or personal factors limiting the set of practical opportunities a person with impairments can reach (Dubois and Trani, 2009, Trani et al., 2011a).

However, the capability approach to define disability has not had the same influence as other approaches to define disability. This model presents an opportunity to analyse the relation between disability and poverty from a multidimensional perspective. This approach recognises that people with disabilities cannot reach the same level of achievement as a person without disabilities, even if they have the same level of resources (Sen, 1999, 2009). This aspect allows the analysis of the relationship between disability and poverty and provides an accurate explanation of why people with disabilities have higher levels of vulnerability to poverty.

As a result of the lack of consensus concerning what are the most important capabilities, the operationalization of this approach has been difficult. In the context of disability, Burchardt (2004) proposed a set of questions to ask about disability based on this approach. The questions can included aspects related to opportunities and to financial, social or impairment barriers. Depending on the objectives of the questionnaire, other types of deprivations can be asked (Burchardt, 2004). The ICF as an instrument can also be helpful for the operationalization of the capability approach (Mitra, 2014).

The CA allows the analysis of the extra costs of disability and provides a perspective to analyse the relationship between poverty and disability from a multidimensional perspective (see chapter 2, 4 and 9 for details) (Dubois and

Trani, 2009, Groce et al., 2011a, Groce et al., 2011b, Kuklys, 2005, Mitra et al., 2013a, Mitra et al., 2013b, Trani and Bakhshi, 2013, Trani et al., 2011a, Trani et al., 2013, Trani et al., 2011b, Trani and Loeb, 2012, Welch, 2002). This approach assumes that as a result of their condition people with disabilities have different needs, and governments should consider the existence of individual differences when social inclusion policies are planned. The CA includes dimensions not only related to personal or social factors, but it also allows the analysis of how agency and empowerment affect individuals decisions (Trani et al., 2011a). This approach also offers an opportunity to analyse disability from a social justice perspective, understanding diversity between individuals (Brighouse and Robeyns, 2010, Richardson, 2006).

In summary, the CA offers a good alternative to understand and define disability. It moves forward the analysis without having to define disability from individual or social perspectives. Given that this approach was established in an effort to analyse well-being and development, it provides useful tools to analyse the relationship between disability and poverty, from a multidimensional perspective. It also proposes a definition of disability as the reduction of practical opportunities, given by the existence of environmental, social and economic barriers for people with impairments. Indeed, social, environmental and economic factors play a determinant role in the definition of who is or is not disabled. As a result, social policies based on this approach should consider disability as an interaction of three aspects: personal characteristics, available goods and environmental factors.

In this context, policies should aim to restore equal opportunities for people with impairments.

3. THE UNITED NATIONS AND DISABILITY

The UN has had a positive impact on how States define social policies for people with disabilities around the world. Indeed, as a result of different conventions, declarations and other documents related to disability some governments have implemented anti-discriminatory or equality of opportunities policies for people with disabilities.

In the last 40 years different declarations have been enacted by the UN. The first was the Declaration on the Rights of Mentally Retarded Persons in 1971, followed by the Declaration on the Rights of Disabled Persons in 1975. The two declarations were the start of the UN intervention to internationalize disability policies (Barnes and Mercer, 2011).

During the1980S two main events influenced the legislation for people with disabilities in different countries, the designation of the *International Year of Disabled Persons* in 1981 and the *Decade of Disabled Persons* (1983-1992). The World Programme of Action with respect to disability was adopted in December 1982 by the UN General Assembly, with the main purpose to develop a strategy to prevent disability, promote rehabilitation and equalise opportunities for people with disabilities around the world (Lang, 2009).

In 1993, the Standard Rules on the Equalization of Opportunities for People with Disabilities were enacted by the UN. It became one of the most influential

documents on disability, and based on it, several countries around the world, implemented anti-discrimination and disability legislation (Barnes and Mercer, 2011). The Standard Rules has the objective to ensure that people with disabilities, who are members of a society, exercise their rights and obligations. Given the high number of barriers that people with disabilities face, States have the obligation to remove barriers and to guarantee equal participation of people with disability and their organization (UN, 1993). The document includes 22 rules covering three aspects (1) preconditions for equal participation (four rules); (2) target areas for equal participation (eight rules) and (3) implementation measures (nine rules) (UN, 1993). It includes areas to equalize opportunities and how States can implement different strategies to ensure the fulfilment of those. In addition, all signatory States are morally obligated to implement social policies, whose main objective is to equalise opportunities for people with disabilities (Lang, 2009).

Given the discretionary status of the Standard Rules, their effect was not the expected. By the end of the 1990s, efforts around the world started to drive the creation of an international legal framework to pressure signatory States for the promotion and the guarantee of rights of people with disabilities. The negotiations of the CRPD were conducted from December 2001 to May 2008, with the participation of groups of people with a disability increasing throughout the years. On the 3rd May 2008 the convention was published and ratified by 20 signatory States (Lang, 2009).

The Convention is based on eight principles: i) respect for dignity and individual autonomy, ii) non-discrimination, iii) participation and social inclusion in society,

iv) respect for difference, v) equality of opportunity, vi) accessibility, vii) equality between men and women and viii) respect for the evolving capabilities of children with disabilities (UN, 2008a). Additional to the Convention, the States can sign an optional Protocol, whose purpose is to provide mechanisms for people with disabilities to appeal to the UN committee on the rights of people with disabilities. The protocol is optional; and not an obligation under the Convention (Lang, 2009).

Currently, 159 countries have signed the Convention, 92 the optional Protocol, 151 have ratified the Convention and 85 the Protocol (United Nations ENABLE, 2014). The number of signatory States is growing; however, without ratification States are not obliged to implement strategies, policies or programmes to enforce the Convention.

In summary, the UN has had a high level of influence on the establishment of an international legal framework to guarantee the rights of people with disabilities. Since 1970 different declarations have included people with disabilities as a vulnerable group. The Standard Rules and the CRPD have had an important effect on the promulgation of anti-discriminatory and equality of opportunities legislation around the world. Both documents have influenced how States implement social policies for people with disabilities and guarantee their human rights.

4. MEASUREMENT OF DISABILITY

The definition of disability directly influences how this category is measured. Indeed, different measures exist based on each model of disability. According to

Grönvik (2007) five types of definitions exist in the literature: subjective, functional, administrative, social and relational. The individual (including medical) model approach usually uses functional and administrative definitions, asking questions related to individual functions (functional) or when the person is defined as disabled for a medical board in order to obtain a benefit. Under this model parameters of normality play a fundamental role in defining who is or is not disabled. The most common measures are the Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL), both have the objective of evaluating the capacity of a person to carry out daily functions and were developed by health care professionals. Finally, these measures do not include aspects related to environment or contextual factors (Hahn and Hegamin, 2001).

In 1993, the WB proposed a measure of disability, whose main objective was to assess disability associated with disease and death. It indicates the number of years lost as a result of an ill-health (Hahn and Hegamin, 2001, Mont, 2007b). This measure is accepted as a good indicator of health-illness, but it does not allow the analysis of changes in functionality levels of people with impairments. Moreover, it does not analyse what effects social and environmental barriers have on health conditions and how they contribute in the creation of disability (Mont and Loeb, 2008).

The social model defines disability as a result of social barriers; therefore they should be the objective of measurement. In this context, social, political, cultural and environmental barriers should be the centre of analysis. However, it is difficult to identify what mechanisms create disability and how attitudinal or social

barriers contribute in this construction. As a result, there are not tested measures of disability under a social model (Lang, 2009).

The ICF model uses a relational definition of disability, where individual and social aspects play a role. According to this model, it is important to identify people with impairments and to analyse how access to basic opportunities are reduced for this group (Molden and Tossebro, 2010).

The International Seminar on Measurement Disability was organised by the UN in 2001. Its main objective was to evaluate methods used by government to collect population data about disability; to make recommendations aiming to improve the measurement of disability and to contribute on the formation of institutional and expert networks to collect information on the topic. One main recommendation was to use the concept of disability proposed by the ICF; this will allow the development of a measure that collects comparable data between countries (Altman, 2001b). Given the need of statistical and methodological work at the international level, aiming to facilitate collection and comparison of data between counties, the WG was created after this seminar. This group meets annually with the participation of members of statistics departments from different countries around the world (Washington City Group (WG), 2013b).

The WG developed and tested a short questionnaire to collect information on disability in population and household Censuses (Miller et al., 2011, Mont, 2007a, Mont and Loeb, 2008). The short questionnaire includes six questions, each of them related to a type of difficulty and with four options associated with severity (Table 3.3).

TABLE 3. 3. SHORT QUESTIONNAIRE WG

1. Do you have difficulty seeing, even if wearing glasses?	a. No - no difficulty b. Yes – some difficulty c. Yes – a lot of difficulty d. Cannot do at all
2. Do you have difficulty hearing, even if using a hearing aid?	
3. Do you have difficulty walking or climbing steps?	
4. Do you have difficulty remembering or concentrating?	
5. Do you have difficulty (with self-care such as) washing all over or dressing?	
6. Using your usual (customary) language, do you have difficulty communicating, for example understanding or being understood?	

Reproduce from WG (2013c).

Currently, the WG is developing an extended set of questions. The main objectives are to include different domains that were not covered by the short set; to include more information on impairments and to create a single measure for each difficulty. The extended set of questions can be included in national health surveys or applied independently. Questions in basic activity domains such as vision, hearing, mobility, communication, cognition/remembering, self-care, upper body, mental health (anxiety and depression); pain and fatigue are included (WG, 2011).

In conclusion, the measurement of disability has been influenced mainly by the individual and the ICF models. These models have had a major influence on what type of indicators and questions international agencies define as important in measuring disability. One major advance in the unification of a measure on disability was the creation of the WG in 2001. The WG developed and tested a short set of questions to be included on population and household Censuses. These questions have been implemented in a high number of countries, and are intended to identify people with difficulties and to compare information on disability between countries.

5. DISABILITY IN LA

Understandings of disability in LA have been mainly influenced by the UN and the WHO. Indeed, since the 1980s disability has gained importance in the region. The Standard Rules and the CRPD have been two of the most influential documents on disability and have had an effect on how governments define and understand disability in national legislation. Depending on the year that laws on disability were enacted, the definition of this category changed. In fact, if the legislation was passed before 2001, the definition proposed by the ICIDH was used. Legislation and social policies published after this year commonly follow the definition presented by the ICF (IDRM, 2004, Mujica, 2003, Samaniego, 2006, Stang Alva, 2011).

During the 1980s and part of the 1990s, disability was not recognized as a social problem in most LA countries. Before this time, people with disabilities usually received support from their families or the church. At the end of the 1980s and during the 1990s, constitutional reforms in different LA countries incorporated people with disabilities as a vulnerable population. Two main examples were Brazil (1988) and Colombia (1991), countries that for first time included articles recognising the constitutional rights of people with disabilities (Mujica, 2003).

As a result of the influence of the Standard Rules and other international declarations related to disability, governments in LA elaborated an Interamerican

and an Iberoamerican[3] strategy to include disability in the public agenda. At the Interamerican level, the most important document was the *Inter-American Convention for the Elimination of All Forms of Discrimination against People with Disabilities* (1999). This convention defines disability as

> *"… a physical, mental or sensorial impairment, whether permanent or be temporary, that limits the capability to perform one or more essential activities of daily life, and which can be the caused or aggravated by the economic and social environment"* (Organization of American States (OAS), 1999).

This convention includes aspects intended to guarantee human rights for people with disabilities. It emphasises the importance to equalize opportunities for social and political participation of this group. It was the first and only declaration in the region, whose main objective was to eliminate discrimination for people with disabilities. Although the Convention was relevant and most LA countries signed and ratified it; it did not have the expected influence on the promulgation of legislation on disability (Reyes-Ortiz et al., 2006, Samaniego, 2006).

At the Iberoamerican level, 2004 was declared the year for people with disabilities. The main objective of the celebration of the *Iberoamerican year* was to encourage social inclusion for people with disabilities using strategies to protect their human rights and to equalize opportunities. A large number of activities were organised during this year, including the seminar "*2004: an opportunity for people with disabilities*". During this seminar, the importance of social movements of people with disabilities was recognised and the relationship between disability and

[3] Interamerican countries are countries in the North, Central and South America. Iberoamerican countries are countries in the Americas that were previously a colony of Spain or Portugal and these two countries.

poverty was acknowledged. In addition, the second meeting of the National Committees on Disability in LA was celebrated during the same year. In general, several activities were planned in each country of the Iberoamerican network. All activities had the main objectives to improve the social inclusion of people with disabilities in each country, to increase the social and political participation of groups of people with disabilities; to recognise the need of having information on disability and to acknowledge the relationship between disability and poverty (Samaniego, 2006).

In 2006, the OAS elaborated the *programme of action for the decade for human rights and dignity of people with disability in America (2006-2016).* This document established that State members should implement a number of strategies to guarantee human rights of people with disabilities and to equalize opportunities. It recognises the importance of having objectives and programmes related to different key areas: health, education, employment, accessibility, social and cultural participation and sensitization of non-disabled people. Finally, it gives advice about types of strategies governments should implement, aiming to guarantee the human rights of people with disabilities. Given that the programme was not mandatory for all State members; it has not had a significant impact on the legislation on disability in the region (Samaniego, 2006).

The existence of Iberoamerican and Interamerican initiatives for disability did not guarantee that LA governments protected the human rights of this population. Access to basic opportunities for people with disabilities is not completely covered by national legislations and in some cases is limited to special services. Only after

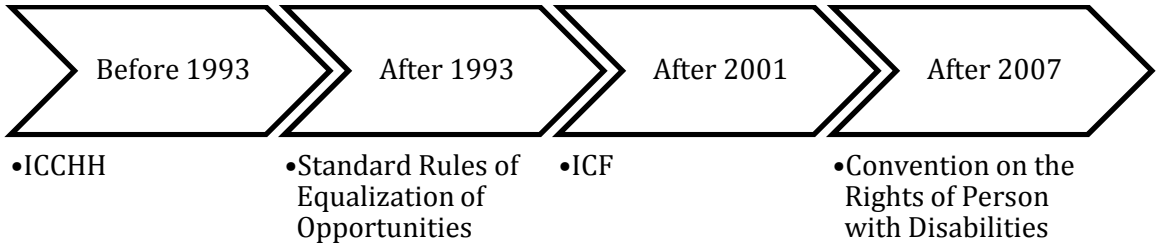
2007, when the CRPD[4] was enacted, countries in LA started to change their legislation. The main objective was to include a human rights perspective and to move from an individual model of understanding disability to a ICF model, where society plays a fundamental role (Stang Alva, 2011).

The analysis of the legislation on disability in LA countries revealed that similar aspects have influenced the inclusion of this topic in the public agenda. International declarations and conventions implemented by the UN have been the most influential elements for most LA countries. Four periods can be defined in the declaration of national laws on disability: 1) legislation before 1993 used a definition of disability based on the ICIDH (1980) and did not include a perspective of human rights or aimed to equalize opportunities for this group; 2) legislation between 1993 and 2001 was based on the Standard Rules, aimed to include principles promoted by this document and to equalize opportunities for people with disabilities; 3) legislation between 2001 and 2007 included a definition of disability based on the ICF and aimed to equalize opportunities and finally 4) legislations enacted after 2007 follow the CRPD and aim to guarantee the human rights of people with disabilities and to eliminate all sources of discrimination (Figure 3.3) (Pinilla-Roncancio, 2015)[5].

[4] The CRPD has been signed and ratified by all LA countries and the optional protocol has been signed by all countries in the regions, except Colombia and Belize (UN ENABLE, 2014).

[5] A documentary analysis of the legislation on disability and on social protection of five LA countries was conducted and the results of this analysis are presented in the article Disability and Social Protection in five Latin American countries, submitted and accepted in Disability and Society.

FIGURE 3. 3. EVOLUTION OF DISABILITY NATIONAL LEGISLATION



Reproduced from Pinilla-Roncancio (2015)

Not all LA countries protect the same type of rights in their legislation. In fact, health accessibility, education and employment are the most protected rights and political participation and housing are only protected in Panama and Venezuela. The right to access social security and income are explicitly protected in 9 LA countries (Argentina, Brazil, Chile, Colombia, El Salvador, Nicaragua, Peru and Uruguay). Brazil is the only country that recognises the importance of obtaining national statistics on disability and of including questions related to this topic in population Censuses (Stang Alva, 2011).

In general, most LA countries are lacking in statistical information on disability, an aspect that contributes to the relative invisibility of the problem (Buvinic et al., 2004) The low number of data sources that include information on disability is one reason why governments do not spend enough resources in order to guarantee access to basic opportunities for this group. Although, the legislation of most LA countries does not recognise the importance of collecting information on disability; most countries in the region included questions in this topic in their last censuses (ECLAC, 2010b). Some countries included questions at the household level and based on an individual model of disability. This aspect creates problems

with comparability between countries and it does not allow the recognition of the real magnitude of disability in the region.

An evident incongruence exists between definitions included in the legislation on disability and in households and population censuses. Some countries followed the suggestions made by the WG and others still included questions related to impairments or handicaps (Pantano, 2003). In general, during the 1990s most countries asked questions about impairments or long term health conditions. Those questions are usually associated with the individual model of disability. During the 2000s, especially after the WG published the short set of questions to be included on Censuses, countries started to ask questions related to difficulties and based on the ICF model (Stang Alva, 2011). In addition, no longitudinal surveys that include disability have been applied in the region, making difficult the analysis of the relationship between disability and poverty.

In conclusion, the recognition of disability as a social problem in LA has grown in the last 25 years. The main reason for this phenomenon is the influence that international organisations such as the UN and the WHO have exerted in LA governments. The Standard Rules and the CRPD have been two of the most influential documents on this topic. Iberoamerican and Interamerican initiatives on this topic have followed international strategies to increase the awareness of protecting and guaranteeing the human rights of this group. However, these initiatives have not had the expected influence on LA governments. Additionally, most LA countries included in their censuses, questions related to disability, and

depending on the year that the data was collected, the short set of questions recommended by the WG was included or not.

6. CONCLUSIONS

In this chapter we have seen that multiple perspectives have been used to define disability. The most influential are the individual, the social and the ICF model. In addition, in the last decade the CA has also played a role in how disability is defined and understood. However, there remains much misunderstanding of what disability is and who is or is not disabled. This situation has created different complications on how governments respond to the needs of people with disabilities and their families.

The WG has presented a short set of questions whose main objective is to collect information about six types of difficulties and the severity of each of them. This set of questions can be included in censuses or national surveys. Additionally, the WG is preparing a longer set of questions aiming to collect more detail information on disability.

In LA, disability started to gain importance after the endorsement of the Standard Rules of Equalization of Opportunities in 1993. Indeed, LA countries have followed the suggestions and initiatives proposed by the UN and the WHO. Since the publication of the ICF most countries changed their definitions of disability and after the CRPD was passed, countries started to develop initiatives to protect the human rights of people with disabilities, to guarantee their access to basic opportunities and to eliminate discrimination.

In general, in the last two decades disability has gained more importance in LA. It has been recognised as a social problem and different initiatives to guarantee the social inclusion of this group have been proposed. Nevertheless, there is a lack of knowledge and understanding of the magnitude of disability, of what social and economic implications this problem has and most importantly what the realities of people with disability and their families are.

CHAPTER 4

DISABILITY AND POVERTY

1. INTRODUCTION

The aim of this chapter is to explore how the concepts of disability and poverty are related. As discussed in chapters 2 and 3, the concepts of poverty and disability have multiple definitions and, depending on the perspective, different dimensions play a role in the social construction of these concepts. This chapter analyses the bidirectional relationship between disability and poverty, how it is mediated by social exclusion and what empirical evidence supports this relationship around the world and in LA.

The definition of disability plays an important role in understanding how this condition interacts with poverty. Indeed, the currently widely accepted definition of disability recognises that social factors play a determinant role in the construction of disability. As discussed in chapter 4, different models to define disability exist in the literature, and since the ICF was published in 2001, most LA countries included this definition in their national legislation on disability. Currently disability is understood as the result of the interaction between a health condition and different social factors that act as a barrier in the social inclusion process of people with disabilities (WHO, 2001). It is only in cases where a society is totally inclusive; that is where people living with impairments are not disabled and do not face exclusion from basic opportunities and services, that their risk of poverty is reduced.

This chapter demonstrates how the relationship between disability and poverty became more apparent after the acceptance of the Millennium Development Goals (MDGs) in 2001. Identification of who the poor are and where they live became a priority for most developing countries. It has been recognised that the lack of explicit inclusion of these group in the MDGs and development strategies, including programmes to reduce poverty, is one important limitation in the fulfilment of objectives related to eradicate extreme poverty (P Thomas, 2005, United Nations (UN), 2011).

Disability is not only related to poverty, but also to chronic poverty. The negative economic consequences of disability affect individuals and their families. Several factors interact in the intergenerational transmission of poverty. Some examples of those are ownership of land or housing, low levels of education and poorly paid work opportunities (Chronic Poverty Advisory Network, 2014, Chronic Poverty Research Centre (CPRC), 2005). In households with disabled members, other factors also play a significant role; for example, indirect cost and changes in family roles. This last factor is associated with family members being caregivers and the type of strategies households implement in order to overcome potential reductions in income. Usually when an adult becomes disabled, children may take the role of caregivers or may leave school in order to work; in both cases there is a reduction in human capital of household members and it directly reduces the strategies and options households have to escape poverty.

People with disabilities are not a homogeneous group. Their needs vary according to the type and severity of their impairment, alongside personal and social

characteristics which can also affect their levels of vulnerability. In fact, depending on the type of impairment, different barriers may limit access to basic opportunities and services, such as education, health and employment. As a result of this heterogeneity, policies and strategies aiming to prevent, mitigate or overcome poverty for people with disabilities cannot be the same. There is no one unique strategy that will reduce the risk of poverty; consequently, this group need to be fully and explicitly included in all strategies aiming to reduce poverty in developing countries (Groce et al., 2011b, Kett, 2012, Kett et al., 2009).

Mechanisms to include people with disabilities in the development agenda have moved from a needs-based approach to a human rights approach. People with disabilities were an invisible group, usually not included in development strategies. After the publication of the document on *Disability, Poverty and Development* by the Department for International Development (DFID) (2000), the importance of this group increased. Additionally, states that sign the CRPD have the obligation to guarantee human rights, to reduce discrimination and to improve the life condition of people with disabilities.

Despite the fact that the relationship between disability and poverty has gained recognition in the last decade (Elwan, 1999, WB & WHO, 2011, Yeo and Moore, 2003), there is little effort to analyse the dynamics of this relationship in LA. The relatively small number of sources of data including questions on disability and poverty is one reason why research on this subject is limited. In the last 10 years, the number of national surveys and censuses including questions on the topic has increased, but still there is no in-depth analysis of this relationship and the

identification and analysis of causal relationships is limited by the absence of longitudinal data.

The next section in this chapter describes the relationship between disability and poverty, followed by a discussion on how social exclusion acts as a mediating mechanism between both conditions. The existing empirical evidence is then presented for developing countries and for LA countries. In the final part of the chapter consideration is given as to how disability has been included in policy reduction and development strategies.

2. DISABILITY AND POVERTY: A VICIOUS CIRCLE

As discussed in chapters 2 and 3, our understanding of poverty and disability has changed in recent decades. Disability has moved from an individual to an ICF model, where social barriers play a fundamental role in the creation of disability (WHO, 2001). Additionally, the perspectives employed to understand poverty have shifted from a monetary or an income based approach to a multidimensional one, where aspects related to access to basic opportunities and services play a major role. Given these changes, the study of the relationship between disability and poverty has moved from an analysis of disability as a health shock that increases the risk of poverty or impoverishment of an individual to a more complex relationship, which is bidirectional and associated with social exclusion.

In the last 15 years, the number of studies aiming to describe the relationship between disability and poverty in low and middle income countries has increased (Groce et al., 2011a). Nevertheless, the evidence is fragile and the lack of

longitudinal data does not allow a proper analysis of how these two conditions interact. The WB published a review of the literature on this topic in 1999 (Elwan, 1999). This report argued that around 15% to 20% of poor populations in developing countries are people with disabilities and that households with disabled members have a higher risk of poverty (Elwan, 1999). In addition to this report, after the promulgation of the MDG in 2001, the analysis of who the poor are and why they are poor has become a priority in the development research agenda. It has been recognised that disability increases the risk of poverty and poverty increases the risk of disability and people with disabilities constitute a large percentage of the poorest of the poor (Yeo, 2003, Yeo and Moore, 2003).

Disability and poverty have a bidirectional relationship; meaning that disability is a cause and a consequence of poverty (Figure 4.1) (Braithwaite and Mont, 2008, Elwan, 1999, Yeo and Moore, 2003). On the one hand, low levels of nutrition, limited access to preventive health care, low access to sanitation and clean water and violence are some factors that increase the risk of becoming chronically ill for poor populations. On the other hand, people with impairments face extra costs and barriers in their access to health care services, including rehabilitation and technical aids; they are socially excluded from education and employment and have to assume direct, indirect and opportunity costs, which negatively affects their income and consumption (Elwan, 1999, Groce et al., 2011a, Groce et al., 2011b, Palmer, 2012, Yeo, 2005, Yeo and Moore, 2003). This is not a universal circle that affects all poor or disabled individuals. However, people living in

poverty and people with impairments face higher risks of becoming disabled and poor, respectively.

FIGURE 4. 1. DISABILITY AND POVERTY VICIOUS CIRCLE

Author's own creation

The interaction between disability and poverty depends on individual and social-demographic characteristics. Indeed, aspects related to age, gender, impairment (type and severity), country and region of residence have a direct effect on how the risk of poverty and disability increases (or not). The level of human, social and economic development of a country influences the type and quality of opportunities and services available for all members of a society, including people with disabilities (Mitra et al., 2013b). Nevertheless, physical, social and attitudinal barriers reduce the access to services and opportunities of this group. In a general context, people with disabilities face social exclusion and higher levels of poverty, even in developed countries, where social programmes have been established in order to allow for the extra costs of disability (Burchardt, 2003, Meyer and Mok, 2013, Purdam et al., 2008).

The understanding and study of this relationship has been limited by the nature of available data. A large amount of anecdotal evidence exists on the topic; but difficulties developing a set of questions that enables identification of who is disabled, and the lack of longitudinal data in developing countries, including information on disability, have been two limitations on the analysis of the causal relationship between these two conditions.

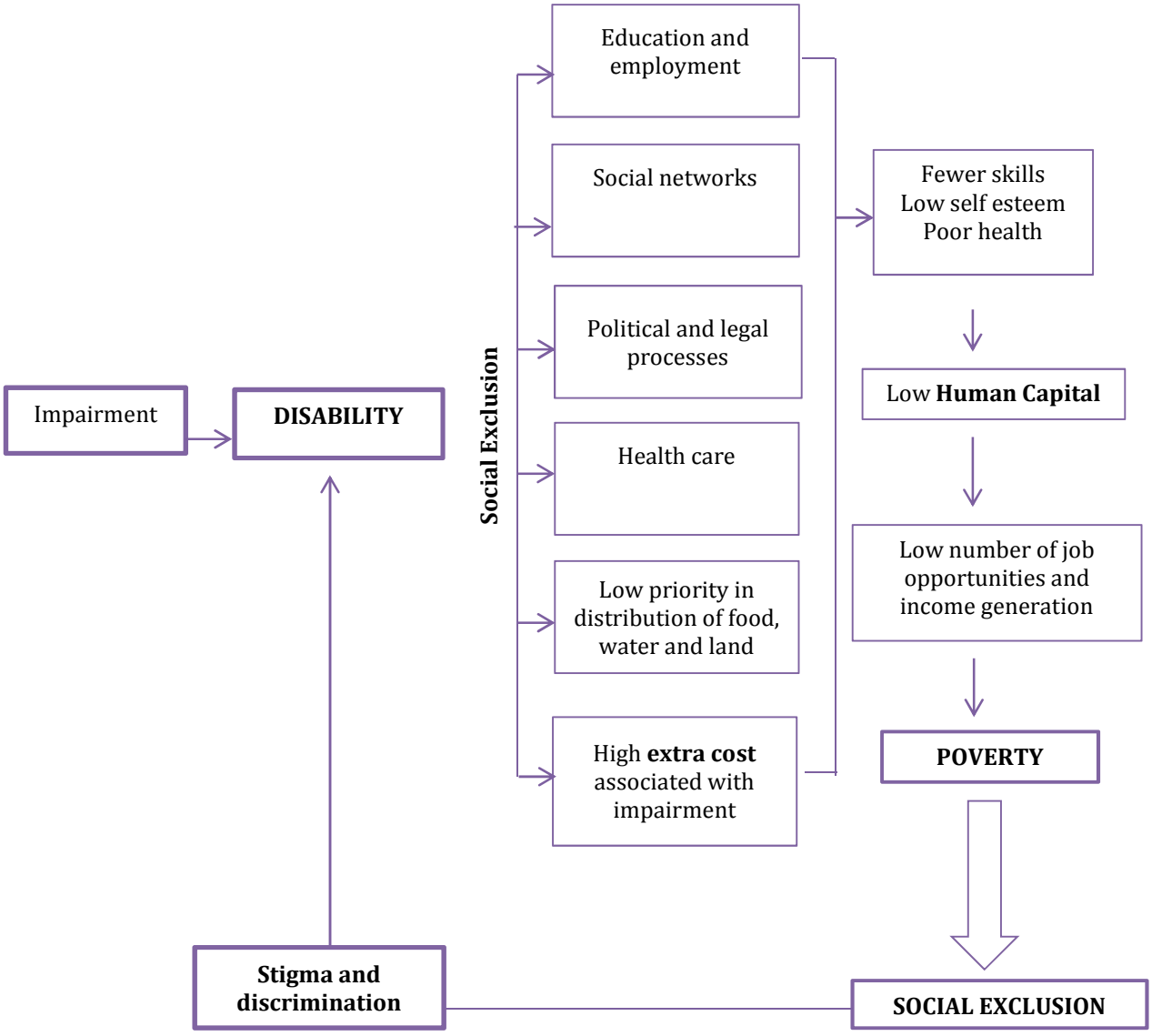
When poverty is understood from a multidimensional perspective, aspects related to access to basic opportunities and services are a priority. In this context, levels of health and education, the types of available employment, opportunities for social and economic participation and social and political empowerment are essential to define who the poor are and why they are poor. As a consequence of the large number of risks of poverty people with disabilities face and the effects of disability on the levels of poverty of an individual or a family, indirect measures of poverty do not capture the severity of this situation. In fact, aspects related to reduction in the levels of human capital, costs of care and effects of social exclusion are not considered in unidimensional measures of poverty (Kuklys, 2005).

2.1 FROM DISABILITY TO POVERTY

People with disabilities are usually socially and economically marginalized. In general, they and their families are considered the poorest of the poor and are excluded from basic opportunities and services, related to health, education and employment (Figure 4.2). In developing and developed countries, this group face higher risks of poverty and impoverishment; have higher rates of unemployment and underemployment and lower education levels. These aspects reduce their

human capital and increase their risk of being chronically poor (WHO & WB, 2011, Yeo, 2001, Yeo and Moore, 2003).

FIGURE 4. 2. FROM DISABILITY TO POVERTY



Adaptation from Yeo (2001 p. 11)

In general, people with disabilities around the world share similar characteristics. They are considered the poorest of the poor, have lower levels of education, higher rates of unemployment and underemployment, have fewer savings and a reduced number of assets including housing and land (Barnes and Sheldon, 2010, Barron

and Ncube, 2010, Braithwaite and Mont, 2008, Elwan, 1999, Filmer, 2008, Groce et al., 2011a, Groce et al., 2011b, Loeb et al., 2008, Daniel Lustig and Strauser, 2007, Mitra et al., 2013b, Mont and Cuong, 2011, Trani and Loeb, 2012, WHO & WB, 2011, Yeo, 2005, Yeo and Moore, 2003).

The negative effects of disability are assumed by individuals and their families. In developing countries, indirect, direct and opportunity costs of disability are usually assumed by the family. This is given by the limited number of social protection services, designed to cover these costs and the important role of the family as a welfare institution (ECLAC, 2013). In addition, the average level of human capital of a household with disabled members is reduced because people with disabilities have lower levels of education and higher levels of unemployment, and in most cases a member of the family adopt the role of caregiver (Palmer, 2012).

Disability affects individuals and their families, and can impact on people differently. The characteristics of a person before becoming disabled determine to some extent how available social resources can be used. However, access to basic services and opportunities for people with disabilities is usually limited by attitudinal, physical and informational barriers. Those barriers have a direct impact on levels of education and health and types of job to which this group has access to. In most cases, schools, universities and other education institutions are not adapted to include people with diverse educational needs, this is one main reason why parents of children with a disability are less likely to take them to school (WHO & WB, 2011). In addition, transportation services are usually not accessible for individuals with reduce mobility, buildings are not designed to

include people with physical impairments, information is not available in braille and only a small number of people can communicate using sign language (WHO & WB, 2011). All these barriers result in people with disabilities having less access to basic services and should be considered when the relationship between disability and poverty is analysed.

People with disabilities face a "handicap conversion" (Sen, 2009). Meaning that a person with a disability would not reach the same levels of wellbeing that a person without a disability, even when they have the same amount of resources. This handicap conversion is one cause of how disability increases the probability of poverty of individuals and households. People with different impairments have special needs that should be covered and in most cases these needs reduce the levels of available income of individuals and their families, creating a poverty trap.

The needs of people with disabilities are usually invisible in social policies that aim to reduce poverty and to increase access to basic services and to the labour market. Aspects associated with the existence of negative stereotypes related to the ability of people with disabilities to work, to actively participate in a society and to learn new things are some of the causes of the invisibility of this group in the public agenda (Emmett, 2005). In most cases, people with disabilities are considered a group that deserves help and are excluded as active members of a society. All this increases the risks of poverty and reduces opportunities for a person to live the life they want.

In conclusion, disability increases the risk of becoming poor or impoverished. Exclusion from basic services such as education and health has a negative impact

on the levels of individual human capital. Extra costs associated with disability are also a main source of risk, not only for individuals but also for their families. If a member of a poor household becomes disabled, the risk of impoverishment and chronic poverty increases and a family can fall into a poverty trap. All these elements play a fundamental role in how the existence of impairments increases the risk of poverty of a person and his/her family.

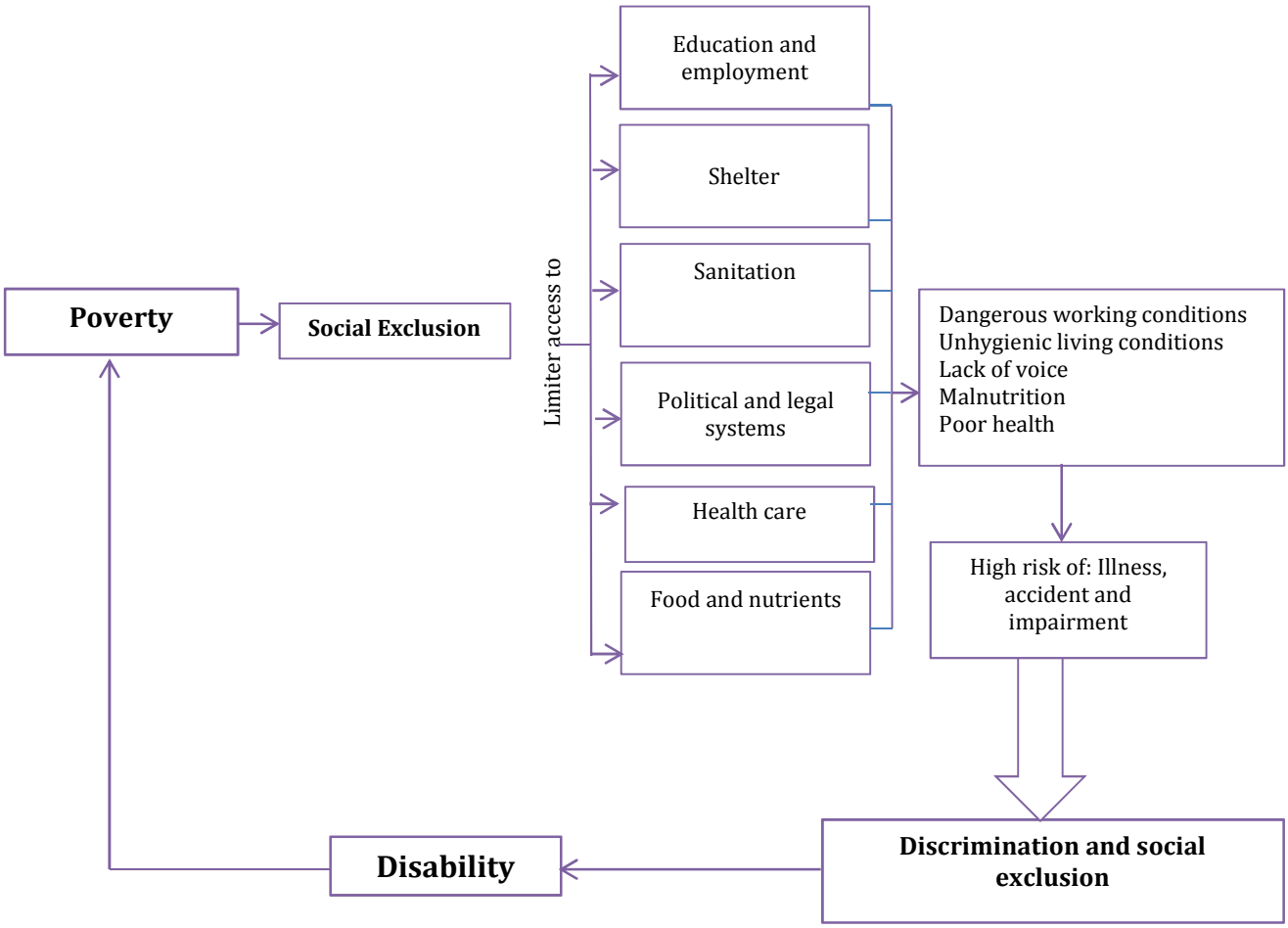
2.2. FROM POVERTY TO DISABILITY

In general poor individuals face higher risks of becoming chronically ill or impaired. They have low access to health care, high levels of under nourishment and usually work and live in unsafe environments, aspects that result in higher risk of illness and injury (Rust and Metts, 2007). Added to this situation, when a person suffers impairment and is excluded from health care services, the risk that an illness becomes a disability is higher. In this context, being poor increases the risk of illness and when a person is excluded from health care services this increases the risk of disability.

Poverty is defined as a deprivation of certain basic capabilities, which include avoiding premature mortality, being under nourished and being illiterate. In this context, a person considered as poor by definition has limited access to food, education, health care, employment and is usually at risk of suffering an illness, injury or impairment (Sen, 1999). The sum of these factors can create a vicious circle where poor people have higher risk of illness, in the cases where they become ill, barriers of access to health care services increase their risk of chronic illness and added to social exclusion processes, the risk of disability is higher. In

addition to this mechanism, low levels of education and knowledge have negative consequences in type and quality of information poor individuals have access to, increasing the risk that a preventable disease can become a chronic condition or impairment. Aspects related to working and living in dangerous places and poor hygienic living conditions (low access to clean sources of water and improved sanitations services) also contribute (Figure 4.3) (Barron and Ncube, 2010, Braithwaite and Mont, 2008, Emmett, 2005, Daniel Lustig and Strauser, 2007, Yeo, 2001, Yeo and Moore, 2003).

FIGURE 4. 3. POVERTY TO DISABILITY CYCLE



Adaptation from: Yeo (2001 p. 11)

In conclusion, individuals living in poverty face different risks that increase their probabilities of becoming ill, having an accident and impairment. Added to this, exclusion from access to preventive, curative and rehabilitation health care services are determinant factors in how impairments become disabilities.

3. MULTIPLE DISADVANTAGES

The likelihood of poverty increases with different personal and social characteristics. Certain segments of the population including women, elderly, minority ethnic groups and people living in rural and remote areas are more vulnerable to poverty. Indeed, when two or more of these characteristics are combined the risk of poverty and exclusion is higher (Chronic Poverty Advisory Network, 2014).

In the case of people with disabilities, it has been recognised that disabled women and disabled girls have lower levels of opportunity in education and employment. In some countries, they have a lower possibility of getting married and starting a family. In general, women with disabilities experience higher levels of physical and sexual violence and are most likely to be excluded from social participation and usually do not have a voice (Emmett and Alant, 2006, Welch, 2002).

In conclusion, individual and social characteristics increase the probability of being poor. In the case of disability, it has been recognised that women with disabilities face higher levels of discrimination and oppression. They experience higher risks of being victims of physical and sexual violence and in some cases of premature death.

4. SOCIAL EXCLUSION OF DISABLED PEOPLE

Social exclusion plays a significant and important role in the relationship between disability and poverty. Exclusion from access to education, to health care and to employment contributes to the creation of the vicious circle between disability and poverty. There is an inter-relationship between disability, exclusion and poverty, which becomes stronger in developing countries, where social protection systems do not provide enough cover to this population. As discussed in previous sections, people with disabilities face barriers in accessing basic services and opportunities, in addition, poor people face exclusion from health care services increasing the risk that an impairment becomes a disability (Rust and Metts, 2007, Yeo, 2001, Yeo and Moore, 2003).

Access to education and labour are crucial to how disability can be a cause of poverty. The age of individuals when they become disabled determines to some extent the access to education and labour markets of an individual (WHO & WB, 2011). In cases where a person became disabled at birth, the probability that she has access to education is lower compared with non-disabled individuals. Additionally, if the person was of working age, access to labour markets and especially to formal jobs becomes a main limitation for social inclusion. Finally, if the person becomes disabled after working age, access to education or labour are not the major issue, but access to health and care services is.

Social exclusion is usually mentioned as one main factor that contributes in the vicious circle between disability and poverty. Nevertheless, empirical evidence

analysing how social exclusion acts as a mechanism between disability and poverty is scarce (Burchardt, 2003, Comite Español de Representantes de Personas con Discapacidad (CERMI), 2003, Hernandez and Cruz, 2006, Rust and Metts, 2007). In addition, as will be discussed in the next sections, social exclusion is not sufficiently described in the analysis of the relationship between disability and poverty.

In conclusion, social exclusion helps in the understanding of how the relationship between disability and poverty is created. This phenomenon is associated with low access to basic opportunities and social and political participation. Two of the main areas where people with disabilities are excluded are education and labour markets. Both have a direct impact in the level of poverty for people with disabilities and their families. Social exclusion is also related to social justice and how minority groups do not have the same opportunities and are discriminated against accessing basic services, affecting their levels of wellbeing and quality of life.

5. EMPIRICAL EVIDENCE IN DEVELOPING COUNTRIES

In the last 15 years a large number of studies have analysed the relationship between disability and poverty. However, the evidence for developing countries continues to be scarce and only a few studies have included a multidimensional perspective of poverty in the analysis (Mitra et al., 2013b, Mont and Cuong, 2011, Mont and Loeb, 2008, Trani et al., 2013).

Two types of analysis can be found in the literature: studies describing the main characteristics of people with disabilities and their families and, studies analysing the levels of income and consumption of people with disabilities. The first type of study suggests that people with disabilities in developing countries share characteristics associated with low access to education, health care and labour markets. In general, people with disabilities have lower levels of education (Filmer, 2008, Groce and Bakshi, 2009); higher extra costs in health care (Mitra et al., 2008, Urquieta-Salomón et al., 2008); low access to rehabilitation and medical services (Mitra et al., 2008, WHO & WB, 2011); high rates of unemployment (Barron and Ncube, 2010, Braithwaite and Mont, 2008, Mitra, 2010, Mont, 2010, WHO & WB, 2011); low levels of political and social participation (WHO & WB, 2011); low access to basic sanitation services, including a clean source of water and sewerage (Lamichhane, 2012, Wapling, 2012) and they usually live in marginalized areas (Mont and Nguyen, 2013).

Studies analysing levels of income and consumption of people with disabilities and their families are inconclusive. Indeed, depending on the country and the existence or not of social assistance programmes for people with disabilities; the levels of income and consumption are higher or lower to those from the general population (WHO & WB, 2011). One example is the study conducted by Mitra et al. (2013b) using the World Health Survey as a source of information. Although differences between the income headcount, the income gap and the gap squared (1.25 and 2 US$) between households with and without disabled members were found, those

differences were not significant most of the countries that were included in the analysis.

It has been recognised that indirect measures of poverty do not capture the real magnitude of deprivation of households and individuals with disability. Indeed, the extra costs associated with each type of impairment, the costs related to caring and the human capital loss in a household are not captured by these types of measures (Kuklys, 2005). Different studies have calculated the poverty gap for people with disabilities and it has been suggested that poverty lines for people with disabilities and their household should be higher in order to include the extra direct and indirect costs that this group faces (Braithwaite and Mont, 2008, Jones and O'Donnell, 1995, Tibble, 2005b, Wilkinson-Meyers et al., 2010, Zaidi and Burchardt, 2005). Studies including a multidimensional measure of poverty have concluded that people with disabilities are deprived in more dimensions that people without disabilities (Mitra et al., 2013b, Trani et al., 2013, Trani and Cannings, 2013).

In conclusion, people with disabilities around the world share similar characteristics. Those are related to low access to education and employment, higher health care costs, limited access to rehabilitation and medical services and low levels of social and political participation. In general, they are excluded from basic opportunities and services, aspects that increase their levels of poverty and their risk of become chronically poor. Empirical evidence about the impact of disability on income and consumption levels of a household is inconclusive; these aspects can be related to the existence of extra costs, which are not captured by

indirect measures of poverty. Studies analysing the effect of extra costs on the final income of individual and families have concluded that it is important and necessary to establish a higher poverty line for people with disabilities.

6. EMPIRICAL EVIDENCE IN LA

Although information on disability is scarce in LA, some studies have described this group and produced findings that people with disabilities usually share similar characteristics between countries. Indeed, people with disabilities in LA are often poor, have low levels of education, live in marginalized regions, have low access to health care services, are unemployed or working without earning a salary (Buvinic et al., 2004, Mitra et al., 2011, Samaniego, 2006).

Although empirical evidence in this topic has grown in the last decade, a detailed analysis of the levels of poverty of people with disabilities in LA is still to be undertaken. Studies using data from different LA countries have been conducted in the last decade, all aimed at describing the situation of people with disabilities and their families, and for the first time in 2012, the ECLAC presented an analysis of the situation of people with disabilities and their families in the region. Similar conclusions can be drawn from all these studies, indeed people with disabilities in the region have low levels of education, high levels of unemployment and low access to health care, especially rehabilitation services. They are more likely to be victims of physical violence and women with disabilities face double sources of discrimination (sexism, disability), aspects that result in even lower levels of access to education, health and employment. Empirical evidence also supports that people with disabilities have lower levels of social participation and high levels of

discrimination and stigma (Chouinard, 2014, Contreras et al., 2006, Cruz and Hernández, 2008, del Poso-González et al., 2008, ECLAC, 2013, Herazo-Beltrán and Domínguez-Anaya, 2013, Hernandez and Cruz, 2006, Hernández and Hernández, 2005, Vargas-Calvo, 2001, Yrigoyen, 2013).

In general, empirical evidence in LA suggests that the situation of people with disabilities is not different than in other developing regions. Indeed, levels of income and multidimensional poverty of this group are higher compared with non-disabled individuals (Groce et al., 2011a, Groce et al., 2011b, Mitra et al., 2013b). Although, evidence relating to income and consumption poverty is inconclusive, further research is necessary in order to determine how the extra costs of disability affect the level of income of an individual or a household with disability. Only one study (Mitra et al., 2013b) using a multidimensional measure of poverty based on the Alkire-Foster methodology included data from LA, according to the results, people with disabilities have higher levels of deprivation associated with extra health care costs and employment (see chapter 9 for details).

7. POVERTY REDUCTION, DEVELOPMENT STRATEGIES AND DISABILITY

Social protection systems have implemented poverty reduction strategies in order to reduce, mitigate or overcome poverty. In the case of disability, social assistance programmes have been implemented in some developing countries with the objective to provide a minimum level of income to households or individuals with disabilities (Gooding and Marriot, 2009, Mont, 2006, 2010, Palmer, 2012).

Although, different poverty reduction strategies have been implemented in developing countries, people with disabilities are still not correctly included or recognised in these strategies. It is assumed that people with disabilities are a homogeneous group with the same needs and characteristics, therefore it is also assumed that strategies designed for vulnerable groups directly include people with disabilities (International Labour Organization (ILO), 2002). In addition, people with disabilities are a relatively invisible group in the development agenda. Usually, disability is considered a costly situation, in terms of human and economic resources and it is mostly associated only with health care, aspects that reduce its importance on the public agenda and is a cause of the invisibility of this situation (Kett et al., 2009).

The complex relationship between disability, labour, poverty and social assistance, in most cases limits access to employment for people with disability. It has become a reason as to why some individuals with disabilities self-exclude themselves from labour markets and have low opportunities to participate actively in employment (Medeiros et al., 2006, Mont, 2006, 2010, Palmer, 2012, Stapleton et al., 2006).

In the last five years, it has been recognised the importance of including people with disabilities in development strategies. Indeed, in the discussions for the post-2015 framework[6], people with disabilities are identified as a priority. As a result, policies and programmes to address the relationship between disability, social exclusion and poverty should be included as part of priority in the national and the

[6] The post-2015 framework is the process that the UN has developed that aims to define the next development goals that will succeed the MDGs in 2015.

international development agendas (Lamichhane, 2012, Martínez Rios and Gómez Serrano, 2012, Wapling, 2012).

After the introduction of the CRPD, signatory states committed to tackle discrimination and reduce barriers in access to health and education services, to decent employment and to social and political participation. These aspects should help to reduce the levels of poverty of people with disabilities and their families. (Chronic Poverty Advisory Network, 2014, Groce et al., 2011b, Kett, 2012, Kett et al., 2009). In order to reduce the high levels of social exclusion faced by this group, development policies should also include strategies to reduce discrimination and to guarantee the human rights of this group. Moreover, there is a need to increase empirical evidence on the lives of people with disabilities; given the lack of rigorous and high quality research on this topic, the inclusion of disability in the development agenda has been limited (Kett et al., 2009).

In the case of LA, two types of social assistance programmes exist: Conditional Cash Transfers (CCTs) and non-contributory pensions (see appendix 1 for a detailed explanation). CCTs programmes do not usually explicitly consider people with disabilities as potential participants, becoming a major barrier for the participation of families with disabled members. Additionally, barriers faced by people with disabilities and their families become a factor that limits the fulfilment of the conditions that these programmes impose to their beneficiaries. Architectural and attitudinal barriers in health care and education services mean the cost of getting a grant are higher than the benefits obtained (Marriot and Gooding, 2007, Mitra, 2005, Mont, 2006).

In conclusion, people with disabilities have often not been included in the development agenda. They are not usually explicitly mentioned in development strategies, or other documents aiming to reduce poverty and social exclusion. It has been recognised that the lack of inclusion of people with disabilities in development goals has negative consequences on the efficacy of the goals themselves. That there is no mention of this group on the MDGs has limited the effect of poverty reduction strategies on poor households with disabled members. Given the recognition of how important it is to include people with disabilities in poverty reduction strategies, the post-2015 framework has explicitly mentioned disability as a priority group.

8. CONCLUSIONS

This chapter has considered that disability and poverty have a bidirectional relationship, meaning that both are cause and consequence of the other. In the case of poor individuals the risks of illness, injury or impairment increase as a result of living in unsanitary and dangerous conditions, low access to preventive and curative health care services and dangerous working conditions. The analysis presented from the literature shows that people with disabilities and their families face higher risks of poverty and impoverishment, because of their low access to education and employment; the extra cost of disability; the reduction in the levels of human capital of a household and the cost of care (indirect and opportunity costs).

Despite empirical evidence on this topic increasing in the last 15 years, most developing countries still need to conduct a detailed analysis of this relationship.

In LA, some studies analysed socioeconomic characteristics of this group, but not detail analysis of the relationship between disability and poverty can be found. Only one study, using a multidimensional measurement of poverty, has included some LA countries, concluding that levels of deprivation and multidimensional poverty of people with disabilities are higher compared to individuals without disabilities.

CHAPTER 5

THE SOCIOECONOMIC CONTEXT OF LATIN AMERICA

1. INTRODUCTION

The main objective of this chapter is to present the socioeconomic context and the main characteristics of LA as a region. Additionally, the chapter explores how social protection systems have evolved since their origins, and what factors affected the expansion of social insurance and social assistance programmes in LA. In the study of the relationship between disability and poverty, it becomes extremely important to understand the socioeconomic context within which this relationship is created. Equally important is to consider how states have implemented strategies to reduce poverty for the whole population and whether or not those strategies have included people with disabilities and their families. It is not an objective of this chapter to give a detailed description of the evolution and changes in social policies in LA, but it will provide a basic understanding of differences and similarities between LA countries. Additionally, the chapter introduces the main criteria used to select the cases included in this study, aspects that will be discussed in detail in chapter 6.

LA is considered a developing region, composed of 18 independent republics. In the last two decades improvement in basic health and education indicators has been observed in LA as a region. Nevertheless, important differences between countries can be observed and some LA countries whilst having medium human development still have low achievement in social indicators. Income inequality has been identified as one major problem of the region, with negative effects on how

the benefits of economic growth reach poor populations. Moreover, LA is described as one of the most unequal regions of the world, with Gini levels for income higher than 0.5 in countries such as Chile, Colombia and Brazil.

This chapter examines two main economic reforms that were implemented during the 20th century: Import Substitution Industrialization (ISI) and neoliberal models. The ISI model was characterized by protection of national economics and a strong role of the State as provider of social services. Neoliberal reforms were implemented first by Chile during the 1970s, followed by several LA countries, these reforms aimed to reduce the State role in the provision of social services, to increase the role of the marked and open national economics. They had positive macroeconomic effects, but increased the levels of poverty and income inequality.

The expansion and development of social security systems in LA was influenced by the type of economic reforms implemented by governments. However, access to social security systems has been always mediated by access to the formal labour market, the type of industry within which the person was working and his/her level of income. The fragmented and stratified social structure of LA countries impacts how workers were included as beneficiaries for social security services.

Social protection systems divide their strategies and programmes in two systems: social insurance (contributory) and social assistance (non-contributory). Social insurance programmes include health and pension systems and cover populations working in the formal labour sector. Social assistance includes all policies, programmes and strategies, whose main aim is to reduce social and economic risk

of vulnerable and poor individuals (Barrientos and Hulme, 2008b, Cecchini and Martinez, 2011).

This chapter is divided into four sections following this introduction. Socioeconomic indicators of LA are described, followed by a description of the socioeconomic development of the region and of welfare states in LA. The next section describes social protection systems and their main characteristics in LA countries, and then the chapter concludes.

2. SOCIOECONOMIC INDICATORS OF LA

LA includes 18 independent republics[7], and is considered by the WB to be a developing region. In 2013, the total population was 615,332,338 growing by 1% each year. By 2012 the average life expectancy in the region was 75 years, with the highest level at 80 years in Costa Rica and Chile and the lowest at 67 years in Bolivia.

All countries in the region have showed improvements in basic health indicators related to the MDGs. Some examples are infant mortality, which decreased from 25.9 per thousand live births in 2002 to 15 in 2012; child mortality decreased from 24 per thousand live births in 2006 to 18 in 2010 and a reduction in maternal mortality from 93 per thousand live births in 2005 to 85 in 2013. In addition to health, LA as a region has also improved in education indicators; the net percentage of school enrolment for primary school has increased since 1991, with 92.2% of children of school age enrolled in primary school and 73% in secondary

[7] Latin American countries are: Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panamá, Paraguay, Perú, Uruguay and República Bolivariana de Venezuela (WB, 2014).

school in 2013. Another important indicator is the literacy rate for people older than 15 years old, with 94.8% of literate individuals in the region in 2012 (WB, 2014). In general, most indicators related to the MDGs have showed an improvement in the last 12 years in most countries of LA. Nevertheless, LA is a heterogeneous region, with countries at different levels of socioeconomic development and average indicators do not reflect the reality of individual in all counties.

In LA, the GNI per capita (constant 2005 US$) in 2013 was $5,913; with an annual GNI growth of 2.3%. However, income differed considerably between countries, for example the GNI per capita in 2013 for Nicaragua was $1,321 and for Chile was $9,299 (constant 2005 US$). Although, the rate of economic growth of the region may be compared with developed regions, problems related to inequality have been a cause of the small effects of growth in poverty reduction in the last decades (De Ferranti et al., 2004, ECLAC, 2010, 2010a, 2012, Huber et al., 2006, Inter-American Development Bank, 1998, O'Donnell, 1996, Perez et al., 2009, Thorp, 1998, UNDP 2011).

The level of human development[8] of the countries in the region is an important aspect in the analysis of the socioeconomic context of LA. According to the latest global Human Development Report (2014) (UNDP, 2014), two LA countries were classified in the category very high human development (Chile and Argentina); ten in high human development and six in medium human development (Table 5.1).

[8] Human development is measured using the human development index (HDI) that includes three main dimensions: health, education and income with life expectancy, educational achievement and the GNI per capita as its main indicators (UNDP, 2014).

When indicators included in the Human Development Index (HDI) are analysed individually, it can be noticed that important differences exist between countries, indeed, the levels of GNI per capital differ by almost 9,000 US$ between Uruguay and Belize. In addition, the inequality adjusted HDI shows that all countries in the region had important reductions, when inequality is included in the analysis.

TABLE 5. 1. HDI IN LA COUNTRIES 2011

HDI Position 2014	Country	Human Development Index (HDI) value	Life expectancy at birth (years)	Mean years of schooling (years)	Expected years of schooling (years)	Gross national income (GNI) per capita (constant 2005 PPT$)	Inequality - adjusted HDI	Overall loss (%)
41	Chile	0.822	80	9.8	15.1	20,804	0.661	19.6
49	Argentina	0.808	76.3	9.8	16.4	17,297	0.680	15.8
50	Uruguay	0.790	77.2	8.5	15.5	18,108	0.662	16.1
65	Panama	0.765	77.6	9.4	12.4	16,379	0.596	22.1
67	Venezuela RB	0.764	74.6	8.6	14.2	17,067	0.613	19.7
68	Costa Rica	0.763	79.9	8.4	13.5	13,012	0.611	19.9
71	Mexico	0.756	77.5	8.5	12.8	15,854	0.583	22.9
79	Brazil	0.744	73.9	7.2	15.2	14,275	0.542	27.0
82	Peru	0.72	74.8	9.0	13.1	11,280	0.562	23.7
84	Belize	0.732	73.9	9.3	13.7	9,364	No data	No data
98	Colombia	0.711	74.0	7.1	13.2	11,527	0.521	26.7
98	Ecuador	0.711	76.5	7.6	12.3	9,998	0.549	22.7
111	Paraguay	0.676	72.3	7.7	11.9	7,580	0.513	24.1
113	Bolivia	0.667	67.3	9.2	13.2	5,552	0.470	29.6
115	El Salvador	0.662	72.6	6,5	12.1	7,240	0.485	26.7
125	Guatemala	0.628	72.1	5.6	10.7	6,866	0.422	32.8
129	Honduras	0.617	73.8	5.5	11.6	4,138	0.418	32.2
132	Nicaragua	0.614	74.8	5.8	10.5	4,266	0.452	26.4

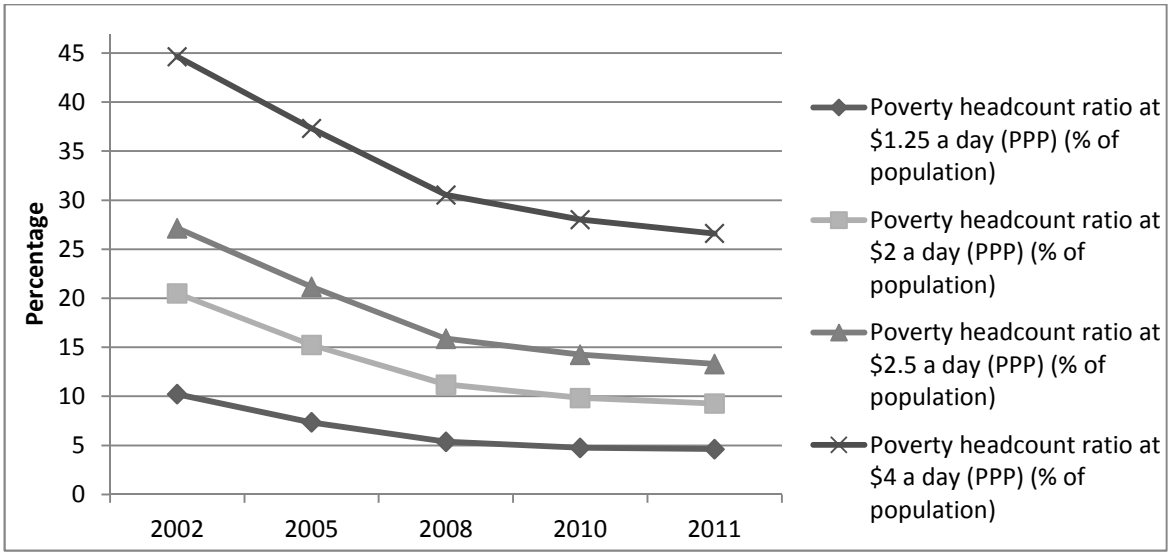
Reproduction from (UNPD, 2014)

Two common problems of LA countries are high levels of income and opportunity inequality and high levels of poverty. As expected, the percentage of populations living under a poverty line is dependent on the threshold used. Figure 5.1 presents the evolution of the poverty headcount ratio since 2002 using five different thresholds[9]. In general the percentage of poor individuals in the region has been

[9] In order to compare with the national poverty line of each country, it is recommended to use the headcount ratio at $4 per day (De Ferranti et al., 2004)

reduced in the last decade but still over 28% of population in LA live in poverty (using a $4 per day line).

FIGURE 5. 1. POVERTY HEADCOUNT RATIO (%) 2002-2011 LA



Source: World Bank data. [Available online: http://data.worldbank.org/topic/poverty. Accessed: 04th February 2015]

Strong differences are evidenced when the poverty line headcount ratios are compared between LA countries. Indeed, when the percentage of the population under a poverty line of $4 a day is compared, Honduras showed an increase in the percentage of the population living in poverty since 2008, while all other countries in the region had a reduction. Uruguay and Chile were the countries with the lowest percentage of poverty in LA (Table 5.2).

TABLE 5. 2. POVERTY HEADCOUNT RATIO $4 A DAY (PPP) (% POPULATION)[10]

Country	2002	2005	2008	2010	2011
Argentina	45.53	25.8	17.24	14.07	11.55
Bolivia	57.75	53.66	40.41	-	29.14
Brazil	41.74	38.04	28.64	-	23.84
Chile	-	-	-	-	9.9
Colombia	49.55	45.21	41.64	36.51	32.77

[10] No data available on Belize

Costa Rica	26.45	22.99	17.01	12.64	13.01
Ecuador	-	43.48	36.71	33.43	29.54
El Salvador	47.03	41.77	40.99	39.25	37.77
Guatemala	61.53	-	-	-	62.39
Honduras	64.28	64.15	52.05	53.3	56.39
Nicaragua	-	50.62	-	-	-
Mexico	38.79	29.89	25.13	23.73	-
Paraguay	49.39	37.6	35.66	30.69	27.75
Peru	48.03	46.49	33.56	26.84	25.79
Panama	40.8	37.49	26.18	24.02	21.25
Uruguay	17.78	21.59	13.95	11.04	8.8
Venezuela, RB	59.84	46.14	-	-	-

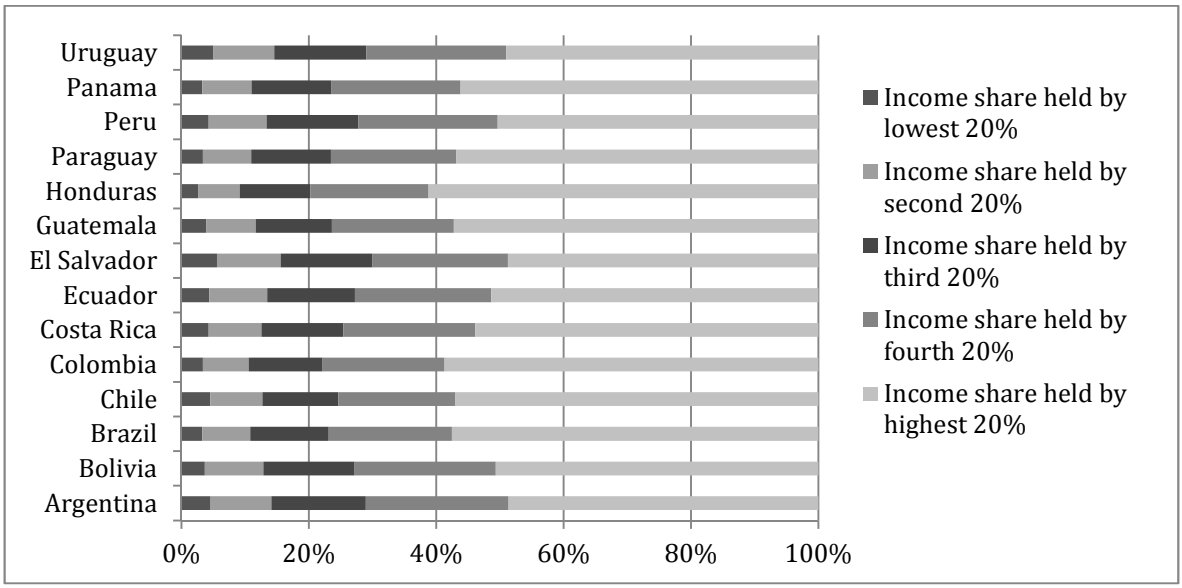
Source: World Bank data. [Available online: http://data.worldbank.org/topic/poverty. Accessed: 04th February 2015]

All countries in LA present levels of income inequality, higher than 0.4 according to the Gini[11] index. There have been small reductions in the levels of inequality in the region; however, LA is still considered one of the most unequal regions in the world, a tendency that has not changed in the last 50 years (De Ferranti et al., 2004, Deininger and Squire, 1996).

Inequality has been identified as the main social problem of LA., considering the region is the most unequal in the world, over Asia and Africa (De Ferranti et al., 2004, ECLAC, 2010a, 2012, Gasparini et al., 2009, IDB, 1998, Morley, 2001, UNDP, 2011). In the analysis of the income share between quintiles, it was identified that in all countries, the income share hold by the highest 20% was always higher than 50%; also, for most cases, the income share hold by the lowest 20% was lower than 6% (Figure 5.2).

[11] The Gini index measures the distribution of income among individuals within an economy deviates from a perfectly equal distribution. This index measures the area between a 45 degree line (absolute equality) and the Lorenz curve. It takes the value of 0 if the society is perfectly equal and 1 if it is perfectly unequal (Haughton & Khandker, 2009).

FIGURE 5. 2. INCOME SHARE BY QUINTILES OF INCOME[12]



Source: World Bank data. [Available online: http://data.worldbank.org/topic/poverty. Last visit: 04th February 2015]

Although, inequality of opportunities has not received as much attention as inequality of income, it has been recognised that it is an important problem in LA (de Barros et al., 2008, De Ferranti et al., 2004, Molinas et al., 2010). The Human Opportunity Report in 2008, presented for the first time information on the levels of access to basic opportunities for children in LA. The main results revealed the existence of inequality on access to education for children in all countries of the region. Indeed, the findings suggested that aspects outside individual control, such as region or parental education played a major role in access to basic services (such as water and sanitation) and education (de Barros et al., 2008).

While inequality has been a social problem in the region for several decades (Bourguignon and Morrisson, 2002, Morley, 2001) the importance of this problem was not completely recognised until 2000. In this year, the Millennium Declaration

[12] No available data on Belize, Nicaragua, Mexico and Venezuela

established eight goals to reduce poverty in developing countries (Barrientos and Hulme, 2008a, De Ferranti et al., 2004). Only after recognising the negative effect of inequality on the impact of poverty reduction strategies and on the levels of social and economic development was this topic included in the political agenda. After this year, it was also identified that the distribution of opportunities (between individuals and groups) should be based on criteria of justice and fairness, and policies and programmes aiming to give access to basic services (e.g. sanitation, water, health and education) should be universal (De Ferranti et al., 2004).

Additionally in the analysis of income inequality, the level of inequality of opportunities has also been a point of analysis for different studies. It has been described that LA has an unequal distribution of basic opportunities such as education and health, aspects that are aggravated when inter groups distribution is analysed. According to the ECLAC (2010, 2010a, 2012) women are more vulnerable to poverty; they have lower access to health care, education and to the formal labour sector.

Countries in LA also have high levels of geographic inequalities. The distribution of resources within a country differs between urban and rural areas and between regions (UNDP, 2011). In the cases of Brazil and Colombia, important differences exist between the number of hospitals and schools in different regions, aspects that create barriers to access these services and increase the risk of poverty for vulnerable groups, for example indigenous and black populations.

In conclusion, all countries in LA have had improvements in their socioeconomic indicators in recent decades. Some examples are life expectancy, mortality rates, literacy and access to primary education. In addition, economic growth in the region has been in general positive, with reductions during the global economic crisis. LA countries are classified as very high, high and medium human development; meaning that significant differences exist between LA countries. Despite the differences, two main problems are common in the region: high levels of poverty and income/opportunity inequality. Indeed, LA is considered the most unequal region in the world, with levels of Gini higher than 0.4 in all countries, with unequal distribution of resources and opportunities within countries and groups.

3. SOCIOECONOMIC DEVELOPMENT IN LA

Two main factors have affected the expansion of welfare states in LA: i) the level of industrialization of the country, which is related to the implementation of ISI from 1930 to 1980 (Pierson, 2004), and ii) the influence of Southern Mediterranean countries and the International Labour Organization (ILO). The ILO influenced the promulgation of laws and other social policies aiming to protect the working age population (Barrientos, 2004, Barrientos and Santibañez, 2009a, Mesa-Lago, 1991).

During the twentieth century, LA countries implemented different economic and political reforms, the main objectives of which were to increase and to accelerate economic and social development (Thorp, 1998). Social, political and economic

history of the region was recognized as one cause of high levels of inequality and poverty of LA. Indeed, historical factors associated with distribution of land, economic structure and development of education systems were some of the most relevant origins of high levels of inequality and the stratified social structure of LA countries (De Ferranti et al., 2004).

The two most significant economic reforms implemented during the twenty century were ISI and Neoliberalism. These two reforms had different effects on the levels of socioeconomic and human development of LA countries. However, both reforms had a small effect on the reduction of poverty and inequality (Baer, 1972, De Ferranti et al., 2004, Huber and Solt, 2004, Lloyd-Sherlock, 2008, 2009, Margheritis and Pereira, 2007, Peet, 1975).

The increase in the levels of poverty in LA, especially after the neoliberal reforms, was associated with a variety of economic and labour policies implemented at the time (Thorp, 1998). It was also related to the lack of visibility that poor populations had, as a result of their low levels of social mobilization and participation (Schneider and Soskice, 2009). Although, in the last few decades the demand for equal rights has increased, the effect on social policies has been limited or non-existent, an aspect that is reflected in the fragmented relationship between State, social organizations and poor populations (De Ferranti et al., 2004).

The following section explores how social protection systems have developed in LA countries and how this process has been influenced by the existence of different macroeconomic reforms. Two main economic reforms are explored: the ISI model between 1930 and 1970 and neoliberal reforms implemented during 1970-1980.

3.1. IMPORT SUBSTITUTION INDUSTRIALIZATION (ISI) MODEL

As response to economic and political crises during the 1930s and after World War II, LA replaced a commodity-export-led model for the ISI model. The main objectives were to protect national economies, to develop infrastructure and to incentivise domestic manufacturing by replacing imports of some products by domestic production (Baer, 1972, Bruton, 1989, Cardoso and Helwege, 1995, Silva, 2007, Thorp, 1998).

Under this model, the State had a central role in economic and social development (Carlos H. Filgueira and Filgueira, 2002, Fernando Filgueira, 1998), with a growth in its levels of authority and autonomy (Silva, 2007). The main purpose of this was to protect national economies and to establish policies that incentivised exportation of national goods and the creation of new industries (Baer, 1972, Bruton, 1989, Felix, 1989, Hirschman, 1968, Silva, 2007). The expected results were a strengthening of national economies, an increase in opportunities for economic growth and an increase in social and economic welfare for the whole population (Bruton, 1989). Moreover, the protection of national economies was going to provide a learning opportunity for the creation of new technologies, with a positive impact on production processes; a fundamental resource in an open economy (Bruton, 1989, Cardoso and Helwege, 1995).

Three main problems were identified during the implementation of the ISI model in LA: 1. Difficulties in the development of new industries; 2. Failure in the creation of new jobs and 3. Failure to control the real exchange rate. The first difficulty was

the consequence of a strong emphasis on the production of primary goods limiting the transition from producing primary to intermediate or final and more profitable products (Baer, 1972, Hirschman, 1968). The lack of creation of new jobs had a negative effect on the distribution of resources between different social classes and as consequence levels of income inequality increased (Baer, 1972, Cardoso and Helwege, 1995). Finally, the protection of new national industries generated an increase in the price of national goods with an impact on the inflation rate, and a reduction in the real exchange rate with a devaluation of the national currency. The main consequence of this was a reduction of exports and a deficit in the balance of payments (Bruton, 1998, Felix, 1989, Hirschman, 1968, Silva, 2007, Waterbury, 1999).

Additionally during the implementation of the ISI model, there was a limited development of social movements in the region. Indeed, it was restricted to some players in the agrarian and the labour market sectors (Foweraker, 2001). The stratified class structure predominated in the region, limited the participation of low educated populations in decision making processes and common political problems associated with clientelism and corruption were a barrier for the development of citizenship in most LA countries (De Ferranti et al., 2004).

Hyperinflation, a balance of payment crisis and the increase of national and external debt were three main causes of the economic deficit during the 1980s and had severe consequences for national industries (Cardoso and Helwege, 1995, Waterbury, 1999). The region's GDP was reduced by 9% during the 1980s, with a negative impact on the GDP per capita and an increase in the percentage of

population living under the poverty line (61.5% in 1986) (Boron, 1995). Furthermore, the levels of income inequality increased and most LA countries reached levels higher than during the 1970s (Londoño and Szekely, 2000).

In order to manage the economic crisis, most LA governments implemented counter-cyclical fiscal policies, reducing expenditures of social programmes directed mainly to poor and vulnerable populations. The reduction in total social expenditure added to the reduction in the number of public jobs that increased the percentage of the population who were poor and reduced their access to basic opportunities, thus increasing their vulnerability to chronic and extreme poverty (Astorga et al., 2005, Boron, 1995, Cardoso and Helwege, 1995, De Ferranti et al., 2004, Huber, 1996, Huber et al., 2006, Huber and Solt, 2004, Korzeniewiez and Smith, 2000, Londoño and Szekely, 2000, Margheritis and Pereira, 2007, O'Donnell, 1996, Thorp, 1998).

As a result of international pressure in 1973, Chile under a dictatorship implemented severe and drastic neoliberal reform. The main objective of this reform was to open up the national economy. Given the different problems associated with ISI model, the crisis during the 1980s and the publication of the Washington Consensus[13] most LA countries followed the example of Chile and implemented this type of reforms during the 1980s and 1990s. The objective of

[13] The Washington Consensus was another key element to implementing the change in the model of the State. This document was presented by the International Monetary Fund (IMF), the World Bank and other US agencies (Margheritis and Pereira, 2007). The document included ten policies, whose main objective was to provide a guide to free-markets and to reduce State intervention. The ten policies were "1) fiscal discipline; 2) reordering of public expenditure priorities; 3) tax reform; 4) financial liberalization …; 5) competitive market-determined exchange rates; 6) import liberalization; 7) promotion of foreign direct investment; 8) privatization of State-owned enterprises; 9) deregulation; and 10) provision of secure property rights" (Margheritis and Pereira, 2007, p. 34).

those was to reduce the role of the State in the provision of services, to increase the role of the market and to open up national economies. It was expected that policies implemented under this new economic approach would reduce poverty and accelerate economic growth of countries in the region (Baer, 1972, Huber, 1996, Riesco, 2009, Silva, 2007, Thorp, 1998).

In summary, after the crisis of the 1930s, LA countries implemented the ISI model as their economic development strategy. Its main objectives were to protect national economies and to reach an appropriate level of industrialization that would allow national industries to compete in a global market. Nevertheless, ISI did not have the expected results; indeed, this model had three major problems: the protection of national industries was limited; the number of new jobs in the industrial sector did not meet the demand and led to deficit on the balance of payments. As a consequence, neoliberal reforms were implemented, aiming to reduce the role of the State in the provision of services and open national economies.

3.2 NEOLIBERALISM

Neoliberalism is an economic model that assumes the participation of the market is essential to economic growth. It is a model consistent with a more competitive and global economy and contrary to ISI, the role and objectives of the State are limited (Huber, 1996, Thorp, 1998). Indeed, under this model the State protects the private sector and guarantees access to basic services such as education, health and social assistance to poor and vulnerable populations (Lora, 2007).

The liberal and export-oriented reforms were implemented in different periods and depended on the type of government and on the levels of democracy of each country. Chile was the pioneer country; it implemented neoliberal policies during the 1970s and drastically reduced the State role in the provision of basic services (e.g. education and health) in the same decade (Barrientos, 2004, Boron, 1995, Huber, 1996, Mesa-Lago, 1999). The macroeconomic instability that LA countries faced during the 1980s created the incentives that other LA countries needed, in order to implement neoliberal reforms and follow the Chilean example. In addition, the publication of the Washington Consensus at the end of 1980s was also a strong reason to implement liberal reforms, open the markets and reduce the State role (Barrientos, 2004, Boron, 1995, Huber, 1996, Margheritis and Pereira, 2007, Mesa-Lago, 2002, Thorp, 1998). Nevertheless, high levels of democracy were a main determinant in how severe neoliberal policies were implemented and how drastic the privatization process was in each country (Mesa-Lago, 1999).

Neoliberal reforms had an effect on the production and provision of welfare by the State in three main components: social insurance, employment protection and public provision of health care and education (Barrientos, 2004). Reforms in health care and pension systems were significant and aimed to reduce the role of the State in the provision of basic services. The Chilean case is a good example; the large extent of the reforms implemented to the pension system, closed the *pay as you go* public system and led to a private and individual one (Barrientos, 2004, 2006, Boron, 1995, Huber, 1996, Huber and Solt, 2004, Huber and Stephens, 2005, Mesa-Lago, 2002).

Neoliberal reforms had positive results for the macroeconomic stability of LA countries. There was a strong reduction in the levels of inflation in all countries, with control of the fiscal deficit and a reduction of the foreign debt (Lora, 2007, Walton, 2004). Other important results were the improvement in economic growth and the liberalization of markets (Margheritis and Pereira, 2007). The reform also contributed to develop democratic systems that before the 1990s were weak or non-existent (Huber and Solt, 2004, Lora, 2007). The reduction of State power, decentralization and increase in popular participation, positively affected levels of democracy in all LA countries, with the final consequence that in LA no dictatorships existed at the end of 1990s (Lora, 2007).

However, the fragmented and vertical social structure that characterised most LA counties restricted the social and political participation of poor and vulnerable populations. Low levels of education, absence of participation opportunities and the implementation of social programmes, that increased State dependency and did not empower individuals, were the main causes of the lack of social mobilization of poor and vulnerable groups (De Ferranti et al., 2004, Sheahan, 2002).

Neoliberal reforms have been strongly criticized for their negative consequences, especially the ones related to poverty and inequality (De Ferranti et al., 2004, Huber and Solt, 2004, Margheritis and Pereira, 2007). Although, economic growth had the expected results in some macroeconomic aspects (reduced levels of inflation and controlled the foreign debt), it did not have a positive effect on reducing poverty rates. High levels of inequality, increased flexibility of labour

markets and the existence of regressive policies in LA were some reasons why the positive effects of economic growth have not reached poor populations (Lindert et al., 2006, Londoño and Szekely, 2000, Ravallion, 2001, Tokman, 2002, 2007a, b).

The privatization of pension, health care and education systems were part of the basic reform package implemented during the neoliberal era (Barrientos, 2009). Individuals that previous to the reform had access to basic services provided by public entities then faced exclusion from those services, that now were provided by private institutions (Margheritis and Pereira, 2007, Tokman, 2002, 2007a, b). Despite the expansion of health care and pension systems, low income workers, self-employed or individuals working in small firms, living in rural areas, women and young, continued to be excluded from those services (Ribe et al., 2010).

Table 5.3 presents the principal reforms that LA countries implemented in their social security systems during the neoliberal reform.

TABLE 5. 3. PRINCIPAL REFORMS IN LA COUNTRIES

Country	Pension reform introduction retirement saving accounts	Relaxation of labour contract regulations	Relaxation of employment termination regulations	Introduction/ changes to unemployment insurance	Health-changes in the public – private mix	Education-introduction of demand subsidy
Argentina	x	x	x	x	x	
Bolivia	x	x				
Brazil		x		x	x	
Chile	x	x	x	x	x	x
Colombia	x	x	x	x	x	x
Costa Rica	x		x		x	
Ecuador						
El Salvador	x				x	
Guatemala					x	
Honduras					x	
Mexico	x				x	
Nicaragua					x	
Panama					x	
Paraguay	x		x		x	
Peru	x	x	x		x	
Uruguay	x			x		
Venezuela	x					

Reproduction from Barrientos (2004).

The labour market suffered different changes that were the consequence of an open economy and globalization. The decrease in public jobs and the increase in private industries aiming to reduce costs and to increase profits, mounted pressure to make labour markets more flexible, affecting the most to low skilled workers and reducing the number of formal jobs in the economy (Tokman, 2002, 2007b). Additionally, the rise of labour costs had a negative impact on the creation of new jobs and encouraged evasion of taxes by employers (Barrientos, 2004).

The percentage of informal workers has increased rapidly in recent decades, with negative effects on the difference between wages of individuals working in low and high productivity jobs (ECLAC, 2012, Huber, 2002, Tokman, 2002, 2007a, b). Different conditions have contributed to this: high demand for high skilled workers; deregulation of the labour sector; fall in public employment and migration of low skilled workers to major cities. As a consequence of the sum of all

these conditions, the general number of individuals working in the informal sector has grown since the 1990s and this has had a negative impact on access to social insurance for vulnerable individuals and their families (Barrientos, 2009, Huber, 1996, Margheritis and Pereira, 2007, Pribble et al., 2006).

Under neoliberalism, the State role was reduced to that of provider of services for those in need. It was expected that the market would create mechanisms to cover individual needs and a large number of jobs, giving individuals the opportunity to participate in the labour market. Therefore, after the implementation of these reforms, social expenditures were reduced affecting the number of subsidies (e.g. food, public transportation and utilities) provided to poor individuals. The main consequence was a large percentage of population without support, increasing their levels of vulnerability to poverty (Huber, 1996, Puyana, 2002).

At the end of 1990s, the economic crisis of the Asiatic countries had a negative effect on the economic growth of most LA countries. Therefore, macroeconomic volatility was a reason for the increase in poverty and unemployment levels, that which generated a strong demand for social protection programmes, whose main objective was to protect against the risk of unemployment (Mesa-Lago and Marquez, 2007).

In summary, neoliberal policies implemented by most LA countries increased the inequality and the poverty of the region. The privatization of health and pension systems and the strong association between access to those and the formal labour market were two main reasons for the low coverage that private systems had. Furthermore, the increase in the demand of highly skilled workers, and the low

supply of those in LA increased the percentage of the population working in the informal sector of the economy that was excluded from the social insurance system.

4. Welfare States in LA

Esping–Andersen (1990) presented a typology of the Western European welfare states. Countries were classified into three types: Conservative, Liberal and Social-democratic. This typology is well known and it has become a theoretical framework for the analysis of welfare states around the world. However, different critiques have been made to this classification such as misspecification of welfare state in Mediterranean countries and exclusion of gender dimensions (Arts and Gelissen, 2002). Additionally, significant differences between socioeconomic characteristics of European and LA countries suggest that the Esping–Andersen typology is not completely appropriate to analyse LA welfare states.

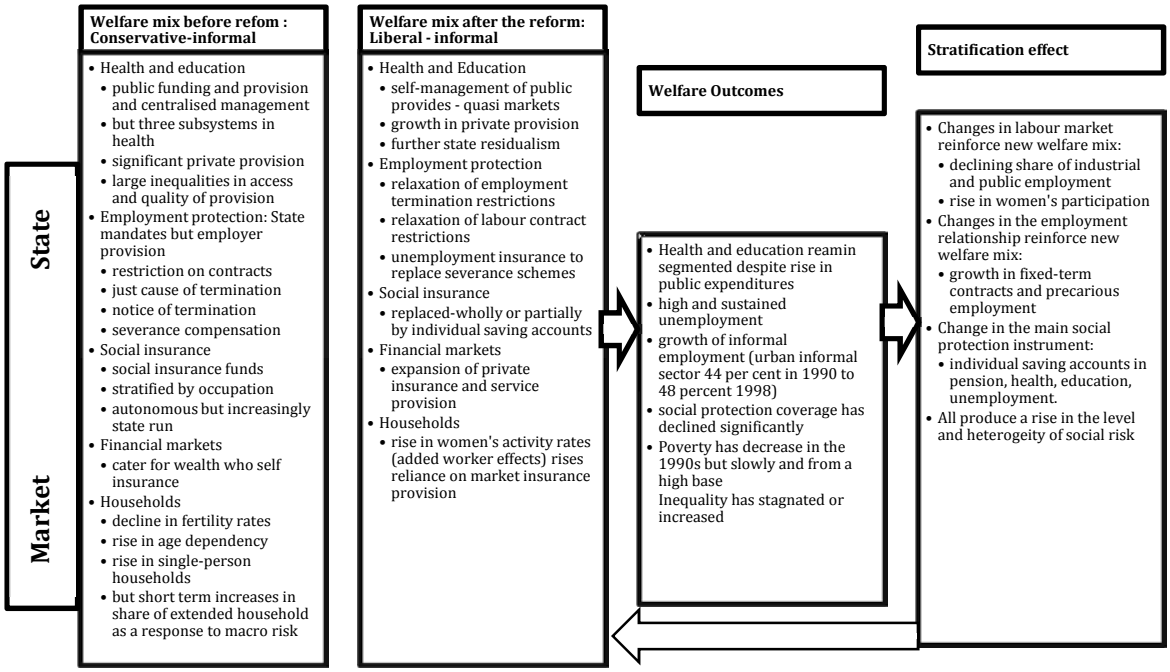
Barrientos (2004) suggests that the history of LA and the measures implemented for the last 70 years make it difficult to apply the Esping–Andersen's typology. Nevertheless, several characteristics of the conservative and the liberal welfare states could be identified in LA countries. Before the neoliberal reforms, the provision of social insurance and employment protection was stratified and segmented. The family and other institutions played an important role in the provision of welfare. However, only people working in the formal sector of the economy had access to social security services, making the welfare regime

conservative-informal[14] (Barrientos, 2004). The implementation of neoliberal reforms during the 1980s and 1990s led to structural changes in the production and provision of welfare services in the region. As a result, the market was the principal provider of social security services, and the identification of social risks was one feature for the provision of insurance, and only formal workers had access to social insurance and the major safety net for informal workers was the family and in some cases non-governmental organizations (NGO) (Barrientos, 2004). Figure 5.3 provides a summary of the key characteristics of the welfare regimes in LA.

The welfare regimes in LA have been described as 'truncated'. The most relevant causes are the segmented and stratified provision of services and the exclusion of non-working populations from social security services (Barrientos, 2009, 2011b, Barrientos et al., 2008, Barrientos and Hinojosa-Valencia, 2009).

[14] According to Barrientos (2004) the welfare regime could be described as well as informal conservative. The main difference is where the emphasis is placed. Conservative-informal placed the emphasis on the type and structure of the institutions that produce welfare. Informal-conservative emphasized the restricted population that was covered by the system.

FIGURE 5. 3. KEY CHARACTERISTICS OF LA WELFARE REGIMES



Reproduction from: Barrientos (2004).

Four periods of development of social policies in LA were described by Cecchini and Martinez (2011). The first period was before the Great Depression in 1930, whose main characteristic was exportation-led growth and poor development of social security services. Between 1930 and 1980, most LA countries implemented the ISI model and protected national industries (second period). After the fiscal crisis of the 1980s most LA countries changed their economic model to neoliberalism, opening LA economics to globalization, liberalization of markets and reducing the State role. For the first time, the State had a minimum role in the provision of social services (third period). Finally, in the last stage started during the first decade of the 21st century; principles of universalization and the guarantee of human rights were included in most social policies and a more active role in the provision of social security and protection services was assumed by the State (Cecchini and Martinez, 2011).

Social policies around health care and pension systems were influenced by international examples, the Bismarck model being the most significant. In fact, most LA countries established their systems using contributions from employees, employers and the State, this being the main characteristic of the Bismarck model. Access to social insurance systems is associated with formal employment and this is a reason for the high levels of stratification and segmentation of social security systems in LA (Barrientos, 2009, Barrientos and Hinojosa-Valencia, 2009, Barrientos and Santibañez, 2009a, Cecchini and Martinez, 2011).

Additionally, levels of democracy in each country affected the expansion of social insurance and social assistance programmes in LA. According to Haggard and Kaufman (2008), in LA three types of "regimes" could be found: 1) democracies, 2) semi democracies and 3) authoritarian. Examples of democratic countries are Uruguay and Costa Rica. These two countries have the longest history of democratic governments, with social security systems that included strategies to cover the whole population (universal social pension and health insurance); the social mobilization of different interest groups from the lowest social classes was higher than in other countries, allowing the inclusion of their needs in social policies. The second group includes countries such as Colombia and Mexico; the main characteristic of these countries was the durability of democratic governments and the competition between parties. Social mobilization was limited and the coverage of social security was lower compared to democratic regimes. The development of social programmes was restricted by the priorities of those political parties in charge. The final group "hard authoritarian regimes" with Chile

as the most important example, did not have an expansion of its social insurance with severe changes in the structure of the social security systems (Haggard and Kaufman, 2008).

Mesa-Lago (1991) classified LA countries into three different groups depending on the development of their welfare state. These groups were established according to the year the pension programme started; the percentage of population cover; the contribution as a percentage of payroll; the share of social security expenditure; life expectancy and the share of population over 65 years old (Mesa-Lago, 1999, 2000, 2002, Mesa-Lago and Marquez, 2007). The first group included: Chile, Uruguay, Argentina and Brazil, in this group, the social insurance system started during the 1920s, it was stratified, enrolling at different stages differing parts of the working population. Armed forces, civil servants and teachers were the first groups to have access to social security, followed by blue and white collar workers in some industries, urban workers and finally agricultural and self-employed. Benefits were different for each group, however given their economic development, social mobilization and urbanization processes, benefits were unified for the whole population (Mesa-Lago, 1991, 2000).

The second group "intermediate countries" included Bolivia, Colombia, Costa Rica, Ecuador, Mexico, Panama, Paraguay, Peru and Venezuela. The social insurance system was established after the 1940s, mainly influenced by the ILO. Levels of industrialization and urbanization differed between countries, but features of development and expansion of welfare systems were similar. The main characteristics were the creation of a managing agency and the establishment of

social insurance institutions to cover some privileged workers, with a slow expansion of coverage, without reaching universality (Mesa-Lago, 1991, 2000). The final group "the late-comer countries" included Guatemala, El Salvador, Nicaragua, Honduras and other Caribbean countries. Social programmes were developed during 1950s and 1960s, with an unified social insurance system, but a reduced coverage of the population, which was limited to people in the major cities of the country (Mesa-Lago, 1991, 2000).

During the 1980s all LA countries established social security systems, which involved three main features: 1) social insurance funds that were stratified and provided pensions, health insurance and unemployment and family benefits; 2) several employment measures and 3) an attempt to provide universal healthcare and education (Barrientos, 2004). During this decade, social assistance programmes were limited to food subsidies and, only after the economic crisis during the 1980s and the establishment of neoliberal reforms did demands for social assistance programmes for poor and vulnerable populations increase. The initial response was the creation of safety nets, followed by the creation of conditional and non-conditional transfers (social assistance programmes) (Barrientos and Hulme, 2008a, Francisco H.G. Ferreira and Robalino, 2010, Mesa-Lago and Marquez, 2007).

As was discussed levels of democracy and social mobilization increased during the 1990s. Therefore, the needs of vulnerable and usually excluded groups were included in the public agenda and a significant expansion of social assistance programmes, especially CCTs, started during the 1990s and continued during the

first decade of the 2000s (Francisco H.G. Ferreira and Robalino, 2010). Additionally, after the commitment to the MDGs in 2001, the reduction of extreme poverty and access to basic services, including sanitation, health and education became a priority for developing countries. All LA countries committed to fulfil the MDGs by 2015 and as a consequence new social assistance programmes to reduce poverty, provide universal education and improve child health were implemented, with CCTs as the most important example (Barrientos, 2011b).

Non-conditional programmes were also expanded, with non-contributory pensions as a major example. The objective was to support poor populations, who did not work in the formal sector and have not fulfilled the minimal requirements to obtain a pension in the insurance system (Barrientos and Lloyd-Sherlock, 2003, Federacion Internacional de Admnistradoras de Fondos de Pensiones (FIAP), 2011). Figure 5.4 presents a chronological description of the major changes in the social security systems of the region.

During the 1990s, the provision of services in LA was as in previous decades segmented and dual. Workers in the formal market were enrolled in the social insurance systems and the provision of services for poor or vulnerable groups was provided by public institutions. Programmes with objectives to target poor populations and to provide economic support to those populations were the principal instrument of social assistance (Francisco H.G. Ferreira and Robalino, 2010).

FIGURE 5. 4.CHRONOLOGY OF SOCIAL PROTECTION IN LA

1920	1940	1950	1960	1980	1990	2000
Argentina	Colombia	Ecuador		**Non-contributory social insurance**		
Brazil	Costa Rica	Central America and Caribbean		Chile	Argentina, Brazil, Bolivia, Costa Rica, Mexico, Uruguay	
Chile	Mexico			**Workfare**		
Uruguay	Paraguay			Chile Argentina Bolivia Colombia Peru		
	Peru				**Social Funds**	
	Venezuela				Bolivia Peru Jamaica	
						El Salvador Guatemala, Honduras, Nicaragua
						Conditional Cash Transfers Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Panama, Peru

Adapted from Francisco H.G. Ferreira and Robalino (2010).

The analysis of social expenditure and its distribution between social insurance and social assistance programmes revealed that contributory pension and health care have a regressive distribution in all LA countries. In other words, poor populations do not have access to these systems or the proportion of the distribution is lower for poor people than for people from higher incomes. In addition, the distribution of secondary and tertiary education benefits the rich populations more than the poor and it is considered regressive. By contrast, social assistance programmes and primary education services have a progressive distribution in LA countries (Lindert et al., 2006). The redistributive effect of social security expenditure depends on the level of democracy of a country. Indeed, social security expenditure in countries with high democratic levels are less regressive than in countries with lower levels of democracy (Huber et al., 2006).

In the last 20 years a variation in the share of expenditure in social insurance and assistance has been evidenced. LA governments tend to respond to economic crisis implementing pro-cyclical fiscal policies, with a reduction of social expenditures

and a direct effect on the living standard of poor populations, increasing the levels of poverty and income inequality (Clementt et al., 2007, Lindert et al., 2006). In general, countries in LA spend less than 15% of their GDP in social protection, and only in Honduras and Guatemala, the share of expenditure for social assistance is higher than for social insurance (Lindert et al., 2006) (Table 5.4).

TABLE 5.4. SOCIAL EXPENDITURES IN LA COUNTRIES[15]

Country	**Social insurance expenditures as a % of GDP**	**Social assistance expenditures as a % of GDP**	**Total social protection expenditures as a % of GDP**
Argentina (2004)	7.7	1.5	9.2
Bolivia (2002)	6.3.	2.0	8.3
Brazil (2004)	11.7	1.4	13.1
Chile (2003)	6.9	0.7	7.6
Colombia (2004)	5.9	0.6	6.5
Costa Rica (2004)	4.3	1.5	5.8
Ecuador (2004)	1.8	1.1	2.9
El Salvador (2000)	4.2	1.0	5.2
Guatemala (2000)	0.7	1.1	1.8
Honduras (1999)	1.6	2.5	4.1
Mexico (2002)	2.6	1.0	3.5
Nicaragua (2000)	5.4	1.1	6.5
Panama (2005)	5.0	1.7	6.7
Paraguay (2000)	1.8	0.4	2.2
Peru (2005)	3.2	0.7	3.9
Uruguay (2005)	9.6	0.5	10.1
Venezuela, RB	1.1	0.6	1.7

Reproduction from: Weigand and Grosh (2008) .

In conclusion, the development of welfare states in LA has been influenced by different international and national aspects. ISI and neoliberalism had a direct effect on how welfare states were established and expanded to the whole population in LA. Democracy has been another aspect that played a significant role in the establishment of programmes to protect the vulnerable and poor

[15] Data from Belize was not included in the original document

populations and consider the needs of those individuals in social policies. Finally, LA countries can be classified according to their levels of democracy and the factors that affected the establishment and the expansion of welfare states. The most popular classifications are proposed by Mesa-Lago (1991) and Barrientos (2004); however, following different approaches other classifications have been proposed. Annex 5.1 provides a description of the structure of social protection systems in LA.

5. SOCIAL PROTECTION SYSTEMS IN LA

In the analysis of social protection systems in LA, is important to understand that the concept of social protection is highly associated with the reduction of risk and vulnerability and to provide support to the poorest. Social protection is defined as "*public actions taken in response to levels of vulnerability risk and deprivation which are deemed socially unacceptable within a given polity or society*" (Conway et al., 2000, p. 5). In this context, social protection recognises that poverty is a dynamic condition, which is negatively affected by economic, social, health and other types of risk.

Since 1990, the WB established the importance of including strategies to reduce poverty and to increase human capital, especially for poor and vulnerable populations. Those strategies were social safety nets, which were defined as "*some form of income insurance to help people through short-term stress and calamities*" (WB, 1990 , p. 90). These types of strategies targeted vulnerable populations, who were constantly facing risks of poverty or were considered the poorest of the poor (WB, 1990). After 2000, the concept of social safety nets was expanded to social

protection; a concept that included a larger range of strategies to reduce and to prevent poverty. This new concept included strategies and programmes around social insurance and social assistance (Cook and Kabeer, 2009).

Strategies and programmes in social protection can be grouped into three main headings: social insurance (contributory), social assistance (non-contributory) and labour market regulations. Social insurance programmes, including health and pension systems, cover the population enrolled in the formal labour sector that is or have contributed to the systems. Social assistance includes all policies, programmes and strategies, whose main aim is to reduce social and economic risks of vulnerable and poor individuals (Barrientos and Hulme, 2008b, Cecchini and Martinez, 2011). Problems related to poverty, inequality and informality did not play a strategic role in the definition and establishment of social security systems in LA. Indeed, most LA countries had social security insurance systems that covered formal and urban employers and only some had small social assistance systems that provided subsidies (e.g. food subsidies) to poor and vulnerable populations (Francisco H.G. Ferreira and Robalino, 2010).

The importance of social protection, especially social assistance programmes, has increased in the last two decades. Currently, almost all LA countries have introduced CCTs as the major strategy to reduce poverty, to increase human capital and to reduce intergenerational poverty (Barrientos, 2013). These programmes have had a positive and significant effect on the levels of education and health of children of different LA countries. However, their impact on the

levels of national poverty is still questionable (Kabeer et al., 2012, Union temporal IFS-Econometria-SEI, 2004).

After the neoliberal reforms the role of the State was limited to the provision of care to vulnerable populations. Economic growth and target policies were the two main tools to reduce poverty. However, the results were not as expected; poverty and inequality increased and after the 2000s aspects related to human rights became a priority in the formulation and implementation of social policies (Solimano, 2005). Indeed, in the last decade, two types of social policies have played a role: 1. Systemic competition, in which the increase in human capital and the reduction of intergenerational poverty are the main objectives; 2. Social policies associated with commitments to human rights protection and seeking to guarantee citizenship rights of each individual in a society (Cecchini and Martinez, 2011).

In the last few years, the ILO has increased the awareness about the need to guarantee a minimum level of income to the whole population (Hagemejer et al., 2009, Social Security Department International Labour Office, 2008). The proposal of the ILO includes four strategies: 1) universal old age and disability pensions; 2) basic child benefits; 3) universal access to essential health care and 4) social assistance-employment scheme. This package explicitly includes people with a disability as a vulnerable population and highlights the need to protect them and their families from poverty.

6. CONCLUSIONS

LA is a developing, middle income region, composed of 18 independent republics. In recent decades improvements in basic health and education indicators have been observed, with reductions in child and infant mortality and an increase in the literacy rate. However, problems associated with income inequality and poverty persist in all LA countries.

The creation, development and expansion of welfare states in LA have been influenced by the socioeconomic structure of the region and the type of economic reforms implemented in specific periods (ISI and neoliberalism). Currently most LA countries have social protection systems divided into two main systems: social insurance and social assistance. Access to social insurance programmes is conditional on working in the formal sector of the economy or to the ability to pay of each individual.

Given that one of the main objectives of social protection programmes is to reduce the levels of vulnerability and risk that individuals face, the analysis of the relationship between disability and poverty should account for how states have included or not into their social protection systems people with disabilities as a vulnerable population. As discussed in previous chapters, the relationship between these two conditions is mediated by social exclusion processes to basic opportunities such as education, health and labour. Therefore in a region that has high levels of income inequality and inequality of opportunities, it becomes extremely important to analyse how disability is a determinant of poverty and how

the levels of poverty differs between households with and without disabled members.

7. ANNEX 5.1: OTHER CLASSIFICATIONS OF WELFARE STATES IN LA

The analysis of welfare regimes has increased in the last two decades. Following the analysis of Esping-Andersen (1990) different authors have proposed new classifications of welfare state, not only in Europe but also in developing regions. Sharkh and Gough (2011, 2010) and Wood and Gough (2006) included variables related to 1) patterns of state, market and household forms of social provision, 2) welfare outcomes and 3) different stratification outcomes. Additionally, Martinez-Franzoni (2008) presented a classification using indicators related to commodification, decommodification and defamilialization.

Despite the differences in the variables included, the results are fairly similar. Usually Argentina, Chile, Brazil, Uruguay and Costa Rica are classified into the cluster with the best characteristics (high levels of expenditures in social protection and the best results in health and education indicators). The second cluster includes countries such as Colombia, Mexico and Panama, and countries from Central America are usually in the cluster with the worst indicators (Gough and Sharkh, 2011, Juliana Martínez Franzoni, 2008, Sharkh and Gough, 2010, Wood and Gough, 2006).

Filgueira (1998) proposed a classification according to the main characteristics of social programmes in each country. The results revealed that three types of

regimes exist in the region. The first “universal stratified” is characterised by the provision of benefits at different levels, depending on the type of employment a person has. The “dual regime” includes countries whose systems provide access based on the region in which the person lives. The last one is the “exclusionary regime”, countries fitting into this classification have high levels of poverty and inequality and access to health and education depends on the ability to pay of each individual.

The typology of welfare states presented by Huber and Stephens (2005) classified countries according to their emphasis on social insurance or social assistance and their percentage of expenditure in health care and education. This typology classified countries in four groups: 1) Chile, Argentina, Uruguay and Costa Rica. 2) Brazil and Mexico, 3) the Andean countries excluding Chile, 4) Central America (except Costa Rica) and 5) the English speaking counties.

In conclusion, different authors have analysed the type of welfare state of LA countries. Most of them reach similar classifications and countries in the region are usually divided into three or four groups according to the characteristics of their social protection systems. In most cases, Chile, Brazil, Uruguay and Argentina belong to the group with the best characteristics and Central American countries (except Costa Rica) belong to the group with the most reduced systems. Table 5.5 presents each LA country classified according to different authors.

TABLE 5. 5 LA COUNTRIES ACCORDING TO THEIR WELFARE STATE

	Haggard and Kaufman	**Mesa-Lago**	**Sharkh and Gough**	**Wood and Gough**	**Martinez-Franzoni**	**Filgueira**	**Huber and Stephens**
Argentina		Pioneer	Group A(2000)	Group 1	Cluster 1	Universal stratified	First group
Bolivia		Inter-mediate	Group B (2000)	Group 1	Cluster 3b	Exclusion ary regime	Third group
Brazil		Pioneer	Group A(2000)	Group 1	Cluster 2	Dual regime	Second group
Chile	Authoritaria n	Pioneer	Group B (2000)	Group 1	Cluster 1	Universal stratified	First group
Colombia	Semi-democracies	Inter-mediate	Group B (2000)	Group 1	Cluster 3a	N/A	Third group
Costa Rica	Democracy	Inter-mediate	Group A(2000)	N/A	Cluster 2	N/A	First group
Ecuador		Inter-mediate	Group C (2000)	N/A	Cluster 3a	Exclusion ary regime	Third group
El Salvador		Late-comer	Group C (2000)	N/A	Cluster 3a	Exclusion ary regime	Fourth group
Guatemal a		Late-comer	N/A	Group 2	Cluster 3a	Exclusion ary regime	Fourth group
Honduras		Late-comer	N/A	Group 2	Cluster 3b	Exclusion ary regime	Fourth group
Mexico	Semi-democracies	Inter-mediate	Group B (2000)	N/A	Cluster 2	Dual regime	Second group
Nicaragua		Late-comer	Group C (2000)	N/A	Cluster 3b	Exclusion ary regime	Fourth group
Panama		Inter-mediate	N/A	N/A	Cluster 2	N/A	Fourth group
Paraguay		Inter-mediate	Group B (2000)	Group 2	Cluster 3b	N/A	Third group
Peru		Inter-mediate	Group B (2000)	Group 2	Cluster 3a	N/A	Third group
Uruguay	Democracy	Pioneer	Group A(2000)	Group 2	Cluster 2	Universal stratified	First group
Venezuela R.B.		Inter-mediate	N/A	N/A	Cluster 3a	N/A	Third group

CHAPTER 6

METHODOLOGY

1. INTRODUCTION

As was discussed in previous chapters, disability is a factor that increases the risk of poverty for families and individuals. People with disabilities are often considered the poorest of the poor and this group is over-represented in poor populations (Elwan, 1999, WHO & WB, 2011). However, there is not enough empirical evidence that proves the existence of the relationship between disability and poverty in LA; data constraints are one major factor that limits the study of this topic in the region.

In the last decade, some of the socioeconomic characteristics of people with disabilities and their families have been established in developing countries, including LA. In general, this group has low access to basic opportunities such as education, health and labour. In most countries, they are excluded from political, economic and social systems (Braithwaite and Mont, 2008, Davila Quintana and Malo, 2012, Filmer, 2008, Graham et al., 2012, Groce et al., 2011a, Groce et al., 2011b, Daniel Lustig and Strauser, 2007, Mitra et al., 2011, Mitra et al., 2013b, Mont and Cuong, 2011, Pandey, 2012, Saunders, 2006, She and Livermore, 2009, Trani and Loeb, 2012). However, there is little information concerning the causal relationship between disability and poverty and studies have only described a possible effect of disability on poverty and of poverty on disability.

In LA only a small number of studies have described the situation of poverty for people with disabilities (Contreras et al., 2006, Filmer, 2008, Mitra et al., 2011). There is a lack of knowledge of the real situation for this population in the region and of the effect of disability on the levels of poverty of families with disabled members. The study of the causal relationship between disability and poverty in developing countries is limited by the lack of longitudinal data[16] that includes questions related to this topic. In the last decade, important improvements in the amount and quality of information related to disability have been observed. Indeed, every year a higher number of countries include questions related to disability in their national surveys and censuses.

In order to provide empirical evidence of how disability affects (or not) the levels of unidimensional and multidimensional poverty of families in LA a small-N comparative variable-oriented design using most -different cases and a cross-sectional design were implemented. This design is observational and uses censuses and national household surveys from Brazil, Chile, Colombia, Costa Rica and Mexico.

This study is based on an ontological perspective that assumes the existence of a reality that can be measured, and the researcher is not an external object, she plays a role, which should be described and defined from the beginning and should not affect the final result of the analysis (post-positivism) (Lincoln and Guba, 2000).

[16] In order to establish causal relationship experimental studies are the most accepted design. However, in the case of disability and poverty conduct this type of study is unethical and natural experiments are difficult to analyse without the existence of different sources of data and in the case of disability, detailed data about different individual, family and social characteristics should be collected in order to analyse the effect of one intervention on the levels of household or individual poverty.

The logic of inquiry follows a hypothetico-deductive analysis and aims to test hypothesis in different contexts and times, looking to generalize the results of this research to other countries in LA.

The overall aim of this research study is explanatory and comparative. The study of the effect of disability on levels of poverty of households in LA has not yet been systematically addressed. In order to contribute to this knowledge, this study aims to answer a primary question that is: How does the presence of a disabled person in a household impact on the risk of poverty in a sample of LA countries? And in addition four specific research questions (detailed below), related to describing the characteristics of households with disabled members and to establish if the risk of unidimensional and multidimensional poverty increases for households with disabled members.

The chapter will provide a detailed description of the research design and a consideration of the practical and ethical issues involved in secondary quantitative analysis, but first ontology and epistemological considerations are reviewed.

2. Ontology and Epistemology

In the process of conducting research, it is important to clarify the ontological and epistemological perspectives of the researcher. Indeed, it is important to define how the researcher defines and understands the nature of reality (ontology), how the nature of knowledge is understood and how relationships between the knower and the known are defined (epistemology). This last point is also connected to questions about evidence, knowledge and levels of rationality in the research. The

definition of an ontological and epistemological perspective will lead to establish what rules and processes comprise what is known (methodology) (Guba, 1990). Each researcher has and applies their own ontological and epistemological perspective in their own research, aspects that influence the manner in which the knowledge is defined and interpreted.

In the history of social sciences different approaches to define and to understand reality have been discussed (see Godfrey-Smith, 2003). All such approaches have proposed different views and understandings of reality (Lincoln and Guba, 2000). A detailed description of all paradigms is outside the scope of this thesis, however Table 6.1 presents an adaptation of "the metaphysics of four inquiry paradigms" as presented by Lincoln and Guba (2000).

TABLE 6. 1. CHARACTERISTICS FOUR INQUIRY PARADIGMS

Item	**Positivism**	**Post positivism**	**Critical theory**	**Constructivism**
Ontology	Naïve realism	Critical realism	Historical realism	Relativism
Epistemology	Dualist/ objectivist (findings true)	Modified dualist/ objectives (findings probably true)	Transactional/ subjectivist (value mediated findings)	Transactional/ subjectivist (created findings)
Methodology	Experimental/ manipulative	Modified experimental/ manipulative, testing of hypothesis	Dialogic/ dialectical	Hermeneutical/ dialectical

Reproduction from Lincoln and Guba (2000)

As the main aim of this research is to test and verify (or falsify) the hypothesis that disability is related to poverty, positivism and post-positivism paradigms are explored in more detail. This does not mean that critical theory or constructivism are not accepted as appropriate and well defined paradigms through which to understand the social world through social research, but their epistemological and methodological approaches are not suitable for this study.

Logical positivism aims to apply the scientific method in social research. It uses a realist ontology, which says that there is a reality that responds to natural laws and is independent of time and space and it is possible to make generalizations. It bases this assumption in a symmetric thesis, meaning that there is a logical and perfect symmetry between explanations and predictions (Blaug, 1992). Positivism assumes a non-interactive posture with the known and aims to control, to predict and to empirically test a theory (Godfrey-Smith, 2003, Hollis, 1994, Hughes and Sharrock, 1990).

Important failures and critiques of logical positivism are the language used by positivists to present the logic of their ideas and the holistic arguments and critiques to inductive logic (Godfrey-Smith, 2003). As a consequence, post-positivism was developed as an alternative paradigm. Post-positivism is – as its name indicates - a modified version of positivism. The ontological perspective assumed is a critical vision of reality, natural laws still are asserted as existing, but it is impossible to fully understand the reality. The impossibility for researchers to behave as external observers was also recognised. Indeed, it was acknowledged that findings are the result of an interaction between knower and known. Finally, although aspects related to control, prediction and hypothesis testing continue to have a vital role, qualitative methods are also welcome (Lincoln and Guba, 2000).

Conscious of the role I play as a researcher defining and understanding 'what is knowledge' and 'what is becoming known', a post-positivist perspective was adopted. This paradigm is more convenient for this study and given that this

paradigm is based on a critical reality vision of reality, it allows me to seek to have a voice (to be present as a researcher) without necessarily losing objectivity.

Different perspectives have been proposed under a post-positivism approach. Some are related to respond to different critiques of positivism and others are implementations and adaptations of this paradigm to specific sciences. Positive economics is an example of an adaptation of this approach to economics and it becomes relevant to this thesis, given that this study applies econometrics as its main tool of data analysis. Positive economics aims to create a set of generalizations that allow predictions of how changes in *X* affect *Y*. Moreover, it bases all judgments on theories and on the importance of theoretical frameworks to support rejections or failings to reject hypothesis (Friedman, 2007). It uses a hypothetico-deductive approach, meaning that hypotheses can be tested against empirical data, and controls are included based on theories. It presents a measurement rigor, which becomes evident in how concepts are operationalized (Friedman, 2007, Hughes and Sharrock, 1990).

In order to fulfil certain levels of rigor, positive economics uses empirical evidence in the construction of hypotheses and in the process of testing their validity. New evidence will provide information to create new theories and hypotheses are tested against empirical evidence. This process continues until a theory is refuted or until it is changed. Positivism and post-positivism do not believe that theories can be completely validated or accepted, indeed, an important post-positivism philosopher; Karl Popper, proposed falsification as an approach to test theories using deduction. In this context, a hypothesis is scientific if can be refuted or

falsified (demarcation) (Blaug, 1992, Dilworth, 1990, Hughes and Sharrock, 1990, Popper, 1963, 1980).

In summary, this study is based on a post-positive epistemological approach, uses a deductive logic aiming to test the hypothesis *households with disabled members have a higher risk of poverty compared with households without disabled members*. The fact that information from different sources and years is used provides the opportunity to test the hypothesis in different context.

As a researcher I am aware that the findings of this research are influenced by factors related to how questions on disability and poverty were asked and answered (cultural bias) and this creates distortions in the data (measurement error). These aspects will be discussed in the following sections.

3. RESEARCH QUESTIONS

This study uses a hypothetico-deductive approach, aiming to test and analyse the relationship between disability and poverty in five LA countries. In order to fulfil this objective, the researcher has proposed different research questions that provide the necessary information to describe, to explore and to explain to some extent the relationship between these two categories in the region. Using a post-positivist epistemology and applying statistical and econometric techniques, different models were proposed to test if the existence of people with disabilities in a household increases (by how much) the risk of poverty of a household.

The primary research question is:

How does the presence of a disabled person in a household impact on the risk of poverty in a sample of Latin American countries?

In order to answer this question, four more specific research questions were proposed in this study, they are:

i. What are the main characteristics of households with disabled members in five LA countries? This question aims to describe the characteristics of people with disabilities and to provide more evidence in this topic for LA.

ii. How does the risk of poverty change (increase/decrease) according to the type of measure of poverty that is used? The objective of this question is to provide empirical evidence of the effect of disability on levels of poverty of households in LA.

iii. How much has the risk of poverty in households with disabled members changed in the last decade in 3 LA countries? This information will provide evidence on how levels of poverty in households with disabled members have changed in the last decade.

iv. Using a multidimensional measure of poverty, what are the main deprivations of households with disabled members in LA countries? How do those differ between countries? And how much do households with disabled members contribute to the national multidimensional poverty rate? The main purpose of this research question is to analyse from a multidimensional perspective the levels of poverty in households with disabled members, and provide empirical evidence of main deprivations of these households.

4. Research Design

4.1 Comparative Methods

Based on a post-positivist paradigm a comparative variable oriented study was designed. A basic assumption of comparative research is that findings should guide to produce general statements related to a social phenomenon (Przeworski and Teune, 1970). This means that general laws can explain social behaviours and that this can be confirmed by observation. Additionally, there are a limited number of development patterns that a society can follow.

Two types of comparative analysis have been proposed in the literature: case-oriented and variable-oriented studies (della Porta, 2008, Pennings et al., 1999, Przeworski and Teune, 1970, Ragin, 1987, Ragin and Zaret, 1983). Both types aim to analyse social phenomena, but using different perspectives. A case-oriented study aims to analyse in-depth specific systems or social groups in a context, to identify its characteristics and all aspects that affect it. Its results are context-base and can only be applicable to a specific case. On the other hand, variable oriented studies aim to test a theory and to abstract the results from socio-temporal parameters, in order to establish general patterns and generalize results (Pennings et al., 1999, Przeworski and Teune, 1970, Ragin, 1987).

Case-oriented studies aim to produce a detailed description of historical outcomes that offer a historical generalization of a phenomenon in a specific context. In some occasions they include elements related to causal-analytical goals. Case-oriented studies use induction and are conducted implementing three steps: 1) search for similarities between the cases; 2) the relevance of those similarities in each case is

analysed and 3) finally the researcher formulates general explanations based on the two previous steps (Ragin, 1987).

Variable-oriented studies have as their objective to create general explanations related to a social phenomenon. This studies are deductive, theoretically driven and test hypotheses. Using this logic of analysis, variable-oriented studies start defining a theory, selecting a number of testable explanations. Then, accurate measures of each explanation are presented to finally conduct statistical testing that will use a representative and relevant set of observations (Ragin, 1987).

Given the epistemological approach of this study, a variable-oriented approach is more appropriate, in order to test hypotheses and to generalize the results. This type of study is explored in more detail in the following section.

4.1.1 Variable oriented Analysis

Comparative analysis aims to reach conclusions that can explain and predict social phenomena. Studies that control for time and space dimensions should generate results that can be generalized in different societies. The use of theory and a clear definition of how concepts are operationalized are fundamental for the adequate understanding of the meaning of the data and subsequent analysis.

Comparative variable-oriented studies use a hypothetico-deductive method. These studies are theory-based and processes of operationalization are vital in the logic of analysis. Two main problems have been identified when developing and conducting a comparative variable-oriented study: i) how to include individual or specific factors in a general analysis and ii) how categories are defined and how

these definitions change across societies and cultures (Przeworski and Teune, 1970).

The uniqueness of systems should be considered, but general factors affecting the whole system and usually ignored in the analysis should be identified (Przeworski and Teune, 1970). Certainly, taking care of specific characteristics of a case will provide useful information. However, it will also limit the analysis to a small number of cases. In this context, the use of a deductive approach helps to define influential factors and control for characteristics that may affect final results.

Theories should explain as accurately as possible a phenomenon. Explanations will be general and parsimonious, including only relevant aspects that explain to a large degree the problem or object of study. Moreover, theories provide arguments by which to select cases; usually cases or systems are selected first and then individuals or groups within each system are included (Przeworski and Teune, 1970).

The sample of cases included in variable-oriented comparative research can be based on two types of designs: most similar or most different systems (Pennings et al., 1999). The first includes cases with similar economic, cultural, political and social features; this design focuses on analysing inter-systemic similarities and differences. Using the logic of control-treatment, similarities are used as control elements and differences as treatment or explanatory elements. The most different system bases its analysis on micro-units (individuals, households, companies, etc.); this design has as an assumption that systematic characteristics do not affect the results at the micro-units. If this assumption is not rejected, the analysis is

conducted within the system and it is possible to compare between systems (Przeworski and Teune, 1970).

A most different system design allows the analysis of subpopulations and individuals within a system. A variable-oriented comparative study can integrate more than one level of analysis (Przeworski and Teune, 1970) and gives the opportunity to explore how different variables interact at different levels. If the main assumption is not violated (systematic elements do not influence the main results), the analysis can provide generalizations for all elements included and relationships between variables can be studied. In cases where individual data is used, aspects related to measurement error should be explored.

Three types of analysis can be conducted using elements from different levels: 1) only analysing variables at one level; 2) using variables from different levels as aggregate at the system level and 3) using variables in different levels. Although an analysis using information from different levels is a good source of evidence, in some cases, it is not a comparative study. To be certain that studies including this type of analysis are comparative patterns of relationships between systems and systematic factors should be included (Przeworski and Teune, 1970).

It is highly important to define a common language of comparison. The operationalization of concepts directly affects the comparability of social phenomena; however, it should not be a barrier to establish comparisons between variables that aim to define the same concept. Different criteria ought to be fulfilled for a concept to indeed be comparable between cases: i) the language to describe the phenomena inside a source should be empirically interpreted, in other words,

the question should be defined in a way that it is possible to measure the phenomena it aims to measure; ii) the same concept must be applied to all observations or cases and iii) the researcher should explicitly mention what transformations were implemented (Przeworski and Teune, 1970).

Two types of measures can be created: direct and inferred measures. The first group aims to measure a specific phenomenon and it is the same for all the cases included. Inferred measures look to measure the same concept but differ in how they were operationalized. These measures include certain number of properties or attributes of the general concept, but depend on characteristics of the systems (Przeworski and Teune, 1970). However, a number of laws should be established to define how flexible the measure is and how attributes allow the comparison between indicators.

Research objectives define what type of measures should be used. Indeed, a conflict between comparability and generalization is always presented in the definition of how flexible concepts and measures should be. In a comparative study a measure should be strict in all the systems, by contrast a study that aims to generalise allows more flexibility in the operationalization of concepts (Blalock, 1982). It is important to have a balance between both the objective of study and the flexibility of concepts included in the analysis.

In conclusion, variable-oriented studies aim to compare and generalize explanations of a social phenomenon. It is a theory-based approach, which looks to test hypothesis. Two main approaches exist to include cases in the analysis: most similar and most different cases. The first assumes that differences between the

results are given by factors related to systemic features and uses a treatment-control method. The most different cases design assumes that systemic characteristics do not play a role; as a result observations from different levels are included in the analysis. Finally, the operationalization of concepts should be clear and follow a logic that allows an analysis between cases, using if not the same measure, one that includes a certain number of attributes of the concept.

4.2. Cross-sectional design

Cross-sectional design is characterised by not having a time dimension and is observational, in addition, it is possible to analyse differences between groups. This type of design is usually concerned with providing a descriptive analysis using information from one point in time (de Vaus, 2001). This design is observational, it differs with experimental designs because they only include information in one period, do not analyse the effects of interventions and do not use control-treatment groups.

Cross-sectional design has different disadvantages and advantages. The main disadvantage is related to not enabling a causal analysis or the effect of changes of independent variables on dependent variables. The advantages are that these studies are cost-effective, provide information about the characteristics of a population and when the right control variables are included, the results can explain to some extent the (causal) relationship between two variables (de Vaus, 2001).

The difficulties in considering issues related to causality are one of the major failures of cross-sectional designs. The inclusion of statistical controls allows the

analysis of relationships between variables; however, the fact that it is done for the analysis and not during the collection stage, means those factors are not random and the effect of all cofounders cannot be controlled. Causal relationships are not completely possible in this type of design, but the design allows for an analysis of factors that can or cannot affect one phenomenon (de Vaus, 2001) . In this case, a theoretically based approach provides the logic of analysis, also what variables should be included and according to the theory how variables are related.

Another limitation of cross-sectional design is the difference in the meaning of questions included. In all types of quantitative data, how questions are interpreted by individuals plays a significant role, becoming a bigger issue if complex social phenomena are analysed, especially phenomenon with inconclusive definitions and sociological features (Blalock, 1982, Blumer, 1956). As a result, the operationalization of the concepts is fundamental for a proper analysis of a phenomenon.

In general, cross-sectional designs are easier to implement and because of lower economic and time costs, they are commonly used in social sciences. However, analyses of causal relationships and of changes over time are not possible, given that the same population is not included at different stages of collection.

4.3. Secondary Data Analysis

Although different definitions appear in the literature for secondary data analysis (Church, 2001, Glass, 1976, Hewson, 2006, Kiecolt and Nathan, 1985, Vartanian, 2011), they have in common that secondary data analysis is the re-analysis of data already produced. According to Hewson (2006) it is "*the further analysis of an*

existing dataset with the aim of addressing a research question distinct from that for which the dataset was originally collected and generating novel interpretations and conclusions" (p. 274) .

Diverse secondary data sources exist; some examples are: governmental or national large scale surveys; population censuses; cohort and longitudinal studies and administrative records (Smith, 2006). The number and quality of each of them differ according to the source; however, different international organizations (UN, WHO, WB) have presented guidelines for the development of national statistics, including population censuses and large scale surveys.

Secondary data analysis has different advantages and disadvantages. The main advantages are low costs in obtaining representative information of a population, it contains information related to different population groups; helps in the analysis and re-analysis of social problems, in testing theories using different data sets; it enables triangulation processes and it is a low cost source of valid and representative information (Kiecolt and Nathan, 1985, Smith, 2006, Vartanian, 2011). On the other hand, the main disadvantages are the discrepancies between the objectives of the research and of collection of the data and lack of control over the questions included in the instruments of collection (Kiecolt and Nathan, 1985, Vartanian, 2011).

In general, the analysis of secondary data is divided into six stages (Heeringa et al., 2010). First, define the problem to be studied, this is based on the literature and it helps to understand multivariate relationships among the population. Second, understand the sample design used for data collection; the process of sampling the

data (clustering, stratification and random sampling) will influence how representative the sample is. Third, understand design variables, underlying constructs and missing data, at this stage, it is important to recognize how concepts were operationalized and decide how to manage missing values. Stages four and five are related to data analysis and interpretation of the results and the final stage is reporting the results.

In conclusion, secondary data is a good source of information. It has a large number of advantages, especially when large national surveys are used as main source. These sources of data can provide information from a representative segment of the population, an aspect that is vital when a research objective is to generalise the results.

5. DESCRIPTION OF THE STUDY

In order to answer the research questions proposed in this study and based on a post-positivist epistemology a small-N comparative variable-oriented approach, using most different cases design, was proposed. Additionally, a cross-sectional design was conducted. This study uses a hypothetico-deductive approach and aims to study the relationship between disability and poverty in five LA countries.

As discussed in chapter 3 and 4, the study of the characteristics of households with disabled members in LA has been limited to descriptive statistics. Indeed, levels of living standards and the risk of poverty for these households have not been described or analysed in detail yet. Moreover, not only does the analysis of levels of income poverty become an important issue in order explore which dimensions

affect the levels of multidimensional poverty of those households, it is also vital for gaining an understanding of their situation of poverty and of the exclusion of people with disabilities and their families.

In the following sections a description of how cases included in this study were selected, sources of information, logic of analysis and operationalization of concepts will be described in detail. In the last sections problems related to measurement error and ethical implications of working with secondary data will be discussed.

5.1. Selection of cases

LA is a heterogeneous region, with a high number of countries that have different socioeconomic characteristics and levels of human, social and economic development. However, as discussed in chapter 5, most countries have high levels of income inequality and poverty and stratified social protection systems. In order to analyse the socioeconomic characteristics of people with disabilities and their families, it was important to include a limited number of countries with different characteristics and that represent to some extent the region.

Following a most-different design, where systematic or macro factors do not influence the results at the micro levels, cases were selected in three stages. First, the socioeconomic characteristics and second and third existence of data sources on disability:

i. Four criteria related to economic, social and human development of each country; Table 6.2 presents a summary of the main aspects used for the selection of the cases in this stage.

ii. Countries with available information related to disability in their population or household census.

iii. Countries with questions asked at the individual level in their last household or population Census.

In the first stage four main criteria were used. First was the classification of the country according to the development of their social security system. As discussed in chapter 5, social security systems in LA were created and expanded in different stages. Using the classification given by Mesa-Lago (1991, 2000) LA countries can be classified as pioneers, intermediate and later comer countries (see chapter 5 for details). In the analysis of the relationship between disability and poverty, it is important to consider aspects related to the existence of services and programmes, whose main purpose is to prevent and/or protect people with disabilities and their families from becoming poor or chronically poor. In this context, countries classified as pioneers or intermediates had a longer history and opportunity to create services to fulfil that objective and are interesting cases for the analysis.

The second criterion of selection was the level of neoliberal reforms that each country implemented during the 1980s and the 1990s. Indeed, not all LA countries imposed the same type of neoliberal reforms for their social security systems and not all did it at the same time. Additionally, levels of democracy played a vital role in the degree of implementation of neoliberal reforms and in how minority groups are represented in political decisions.

The third criterion was levels of human development of each country. Countries with very high and high human development were included. The main purpose was to include countries with high levels of achievement in the three areas that the HDI analyses. It was expected that countries with higher achievements in these areas have included people with disabilities and their families in social policies and strategies to improve education, health and income. The final criterion was the level of democracy of the country. In this case it was expected that countries with high levels of democracy and a large history of social movements, will have a longer process in the discussion to include people with disability in social protection policies.

The main objective in the selection of countries was to obtain a small sample of countries with similarities in the two first criteria, but that represented a heterogeneous group with the second two. In this context, Chile was included as the country with the most extreme neoliberal reforms and Costa Rica as the country with the longest history of democracy in LA. In the first two criteria a large number of LA countries was included, number that was reduced in the second and third stage of the selection process.

TABLE 6. 2. CRITERIA OF SELECTION OF COUNTRIES

Criteria	Reason
Being classified as a pioneer or in the middle group of development of the social security systems	It would allow an analysis of how governments and states have established mechanisms that cover or protect people with disabilities and their families
Different levels of implementation of neoliberal reforms during the eighties and nineties	This would allow an analysis of how neoliberal reforms in different countries influenced or not the implementation of social protection strategies to reduce the levels of poverty of people with disabilities and their families and strategies to equate the access to basic opportunities such as health and education for individuals with any type of limitation.
High to very high levels of human development (according to the Human Development Index)	Given that the HDI includes indicators in three different dimensions of development (education, health and GDP); those countries with very high or high levels in the HDI would have a higher chance to present better results in these three areas for people with disabilities. Indeed, it is expected that in countries with high levels of HDI the levels of poverty and social exclusion of this group will be lower than in countries with low HDI, where the social policies have not reached the whole population.
Democracy: Different levels of democracy	To be able to compare if countries with different levels of democracy have implemented in a different way or not strategies to include people with disability or to reduce their levels of poverty it is important to select countries with a different history. In addition, it is expected that those countries with high levels of democracy social movements of people with disabilities would have a higher development and have a higher level of participation in political decisions.

The second and third stages of selection were related to the existence of sources of data that included questions on disability. In the last decade, the number of countries including questions on this topic in their last census has increased. However, some countries for different reasons asked disability questions at the household level and in most cases, questions related to severity or degree of disability were not asked (ECLAC, 2010b). Using this information as criteria, only countries that asked questions at the individual level were selected. At the end of the processes five countries were included in the sample. Figure 6.1 presents the stages of selection of the sample.

Notably, seven countries fulfilled the criteria, but only five were selected. Ecuador and Venezuela were not included in the sample because they do not represent

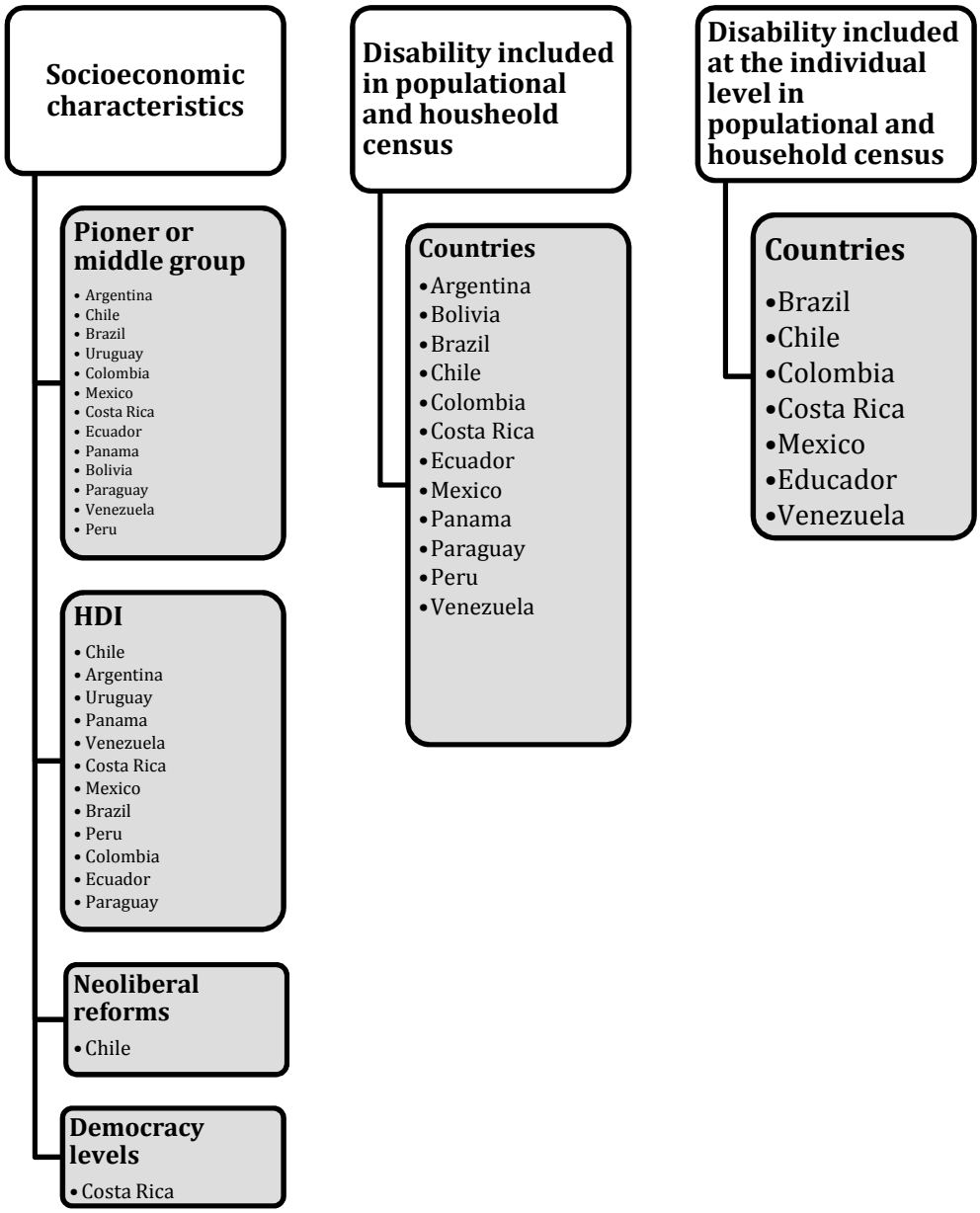
most different cases. Indeed, their characteristics are similar to those from Colombia and Mexico. The final sample of countries included Brazil, Chile, Colombia, Costa Rica and Mexico and they represent around 64% of the total population of LA. Given the different characteristics and histories of each country, the group is heterogeneous and represents to some extent the reality of LA as a region. Table 6.3 summarises the selection criteria for the first stage in each country.

The inclusion of only five cases (small-N) is a possible disadvantage for a variable-oriented design. It is recognised that the situation can be different in other countries but it is possible to assume that in countries with lower social, economic and human development the situation of people with disabilities and their families could be worse than in countries with very high or high development.

TABLE 6. 3. COUNTRIES SELECTED

Country	Mesa-Lago classification	HDI	Neoliberal Reforms	Democracy levels
Brazil	Pioneer	High	Moderate	Low until the end of the eighties
Chile	Pioneer	Very High	Severe	Low (long dictatorship from the seventies to the beginning of the nineties)
Colombia	Middle	High	Moderate	Middle (no permanent dictatorship, but low levels of social mobilization)
Costa Rica	Middle	High	No severe neoliberal reforms	High
Mexico	Middle	High	Moderate to severe	Low (different periods of dictatorships until nineties)

FIGURE 6. 1. SAMPLING PROCESS



In conclusion, the selection of the countries followed a most-different cases design. A three stages selection process was implemented aiming to select a heterogeneous group of countries, which represents differences and similarities of LA as a region. Brazil, Chile, Colombia, Costa Rica and Mexico were selected and included in the analysis, these five countries have similar levels of human development and history of their social security systems, but differ in their levels

of democracy and the severity of implementation of neoliberal reforms. In addition, the five countries included questions on disability in their last censuses at the individual level.

5.2. CROSS-SECTIONAL ANALYSIS

In order to answer all the research questions and acknowledging the difficulties in obtaining comparative data on disability and poverty, a cross-sectional design was implemented as a complement to the comparative design. The main purposes are to describe socio-economic characteristics of people with disabilities and their families in LA; to determine how the risk of poverty changes for people with disabilities and their families according to the measure of poverty and if these levels have changed in the last decade.

In order to improve internal validity of this study, the number of cases was increased using a time dimension (Bartolini, 1993). This approach allows a more detail analysis of each case (countries) and it is possible to compare between and within countries, analysing changes over time. Table 6.4 presents how a time and space dimension played a role in the design of the study.

TABLE 6. 4. SPACE AND TIME DIMENSIONS USING CROSS-SECTIONAL DATA

Dimension	Cases	Type of analysis	Interpretation
Space	5 Countries	Cross-sectional quantitative	Heterogeneous group Most different cases
Time	15 cases	Repeated cross-sectional	Analysis of changes within countries over time

In summary, following the structure of a comparative variable-oriented analysis using most different cases, a cross-sectional design was included, in order to increase internal validity and analyse countries in different moments of time. The inclusion of a higher number of cases using cross-sectional data increases the

number of cases (from 5 to 15) and it allows an analysis between and within countries. The next section discusses the main sources of information included in the analysis.

5.3. SOURCES OF INFORMATION

To compare the levels of poverty for families with disabled members in LA, it is important to use representative information at the national and regional levels. Unfortunately, most LA countries do not have longitudinal household surveys and in the few cases where they do exist, questions related to disability have not yet been included, the number of collection points is low and they have problems of attrition. Two examples of longitudinal household surveys in LA are: the *Encuesta Nacional sobre Niveles de Vida de los Hogares* (Universidad Iberoamericana (UIA) and Centro de Investigación y Docencia Económicas (CIDE), 2015) and the *Encuesta longitudinal Colombiana de la Universidad de los Andes* (Universidad de los Andes, 2015).

Whilst in the last few decades questions related to disability have been included in different surveys and censuses, data constraints are a major limitation in the study on this topic. Several LA countries included a question on disability in their 2000s census round (ECLAC, 2010b). However, census data usually do not include a large number of questions and provide limited scope to analyse socioeconomic characteristics.

Given that it is important to compare the levels of poverty for households with and without disabled members, data sources including information on disability and

socioeconomic conditions of the whole population were used. Two main sources of information were included in the analysis: National household surveys (some of which follow the structure of Living Standards Measurement Surveys (LSMS)), and household/population census. The first source of data provides detailed information of several aspects related to socioeconomic characteristics and the second allows a broad analysis of the situation of poverty for households with disabled members.

Household surveys are one major source of statistical information for social and demographic characteristics of the population. It is a flexible method of data collection, which can include different population-based subjects. Contrary to the census, questions are not asked to the whole population and different sampling methods are used in order to provide representative and also in-depth information of different aspects (UN, 2005a).

LSMS were proposed during the 1990s by the WB, in order to suggest to governments a way of data collection related to standards of living for the population. Additionally, LSMS not only include information on living conditions but also basic questions associated with demographic characteristics. Its main objective is to provide information to analyse links between living standards of a household and social policies and programmes implemented by governments (UN, 2005b). Different countries around the globe have implemented LSMS or have used similar methodologies for the design of national household surveys (Deaton, 1997).

Household and population census data is collected following the suggestions of the UN (UN, 2008b). In general, censuses have an administrative purpose and purposes related to collecting data from small groups without using sampling methods. Censuses are also the main source of information to make population projections and they play a fundamental role in sampling processes of national surveys.

Giving the advantages of LSMS, household surveys and Censuses the three sources of data were included in the analysis. Table 6.5 presents the main sources of information that this study uses. A detailed description of each of them including objectives, sampling processes and main characteristics is presented in chapter 7.

TABLE 6. 5. TYPE OF DATA SOURCE INCLUDED IN THE ANALYSIS PER COUNTRY

Country	Number of cases	Type of source
Brazil	2	Census 2010 Household survey: Pesquisa Nacional por Amostra de Domicilios (PNAD) 2008
Chile	4	Census 2001 Household survey: Encuesta de Caracterizacion Socioeconomica (CASEN) 2006-2009-2011
Colombia	4	Census 2005 Household survey (following LSMS): Encuesta de Calidad de vida 2008-2010-2011
Costa Rica	1	Census 2000
Mexico	4	Census 2010 Household survey (following LSMS): Encuesta Nacional de Ingresos y Gastos de Hogares ENIGH 2008- 2010-2012
Total	15	5 Censuses 10 Household Surveys

5.4. RATIONALE OF ANALYSIS IN THIS STUDY

This study is based on a hypothetico-deductive approach; the main purpose is to test the hypothesis *households with disabled members have a higher risk of poverty*

compared with households without disabled members. In order to analyse the situation of people with disabilities and their families in five LA countries, different econometric models were estimated using the information available in each data source. Figure 6.2 presents the rationale of analysis of this study, which follow a post-positivism epistemology.

FIGURE 6. 2. RATIONALE OF ANALYSIS

Following a similar sequence, the rationale for this study was divided into four stages. First the theory was specified (chapter 2 to 5) and based on it, the hypothesis that households with disabled members face a higher risk of poverty in LA was proposed. Additionally, poverty profiles, whose main objective is to present how poverty varies between regions and subgroups in a society (Ravallion and Bidani, 1994, United Nations Statistics Division, 2005) were analysed and the factors that according to the literature increase the risk of poverty, such as regional characteristics, household and family characteristics, and individual characteristics (ethnicity, sex and age) were included in the analysis. It was also identified that disability has not played a major role or been included in poverty profiles in LA. Based on the literature, different control variables were included and chapter 7 provides a detailed description of each of them.

The second stage was the operationalization of concepts. As was discussed in chapters 2 and 3, poverty and disability have several definitions and depending on the perspective used, different types of measurement have been proposed. The next sections discuss endogeneity and the processes behind the operationalization of these concepts. The third stage was the estimation of several econometric models (chapter 7 and 8) and the calculation of a multidimensional poverty index based on the Alkire-Foster methodology (chapter 9). The final stage was the discussion of the results and the policy implications of those findings (chapter 10).

5.5. ENDOGENEITY IN THE ANALYSIS OF DISABILITY AND POVERTY

In the analysis of a bidirectional relationship, when working with non-experimental data, problems of endogeneity always exist. As was discussed in previous sections, this study uses observational cross-sectional data to analyse the relationship between disability and poverty. As a consequence, it is not possible to control the direction of the relationship and other possible factors that affect the dependent variable.

According to Wooldridge (2010) three common sources of endogeneity exist: 1. Omitted variables; 2. Measurement error and 3. Simultaneity. Given that the relationship between disability and poverty is bidirectional, and as a result of data limitations it is not possible to study what condition generated the other, problems of simultaneity are a constant in the analysis of this relationship using observational data. In this case, it is expected that disability affects not only the levels of income or consumption but also has an effect on individual and household characteristics that are unobservable and have a direct influence on the levels of

poverty of a household. This simultaneity problem will generate a positive bias in the coefficient of disability. In other words, this coefficient will be higher if the pure effect of disability would only be captured by the variable included in the model and other variables (such as level of education head of the household) are not affected.

Omitted variables problems are also a constant in the analysis of this relationship. In this case, the no existence of variables related to social exclusion processes, which are causal mechanisms between disability and poverty create a negative bias. Indeed, the coefficient associated with the variable disability will include a positive term related to social exclusion, increasing the observed effect of the variable disability on poverty, it is expected that if the model would include all variables related to social exclusion, the coefficient related to disability will have a lower value. Finally, measurement error is also a source of endogeneity. As will be explained in section 5.7 questions on disability have a number of sources of error, which are related to the questionnaire, the interview and the interviewer.

According to King et al. (1994) five methods can be employed to manage endogeneity: i. Correcting a biased inference; ii. Study only the situations where the dependent variable is a consequence of the independent; iii. Transform the problem of endogeneity into an omitted variable problem; iv. Select only observations without endogeneity problems and v. Analyse the explanatory variable in order to include only parts that are completely exogenous (instrumental variables).

Given that the different sources of endogeneity exist in this analysis, and two types of bias are expected (a positive and negative bias). It is not possible to know their magnitudes, therefore it will be assumed that the bias generated by the simultaneity problem is larger and the first option proposed by King et al. (1994) will be followed. It will be acknowledged that the values of the coefficients related to disability are larger than the ones obtained in the analysis, given that disability can also affect access to the labour market, level of education and other independent variables included in the analysis.

As a consequence of the complexity of disability as a social phenomenon, it was not possible to implement other options to manage endogeneity. It was not possible to transform the dependent variable; or to select only cases were disability was not a result of poverty or to find an instrumental variable for disability. The negative consequences of endogeneity are acknowledged by the researcher, especially data limitations, such as the lack of longitudinal data or data on natural experiments. Nevertheless, it is also recognised the importance of conducting studies analysis this relationship and the importance of increase the visibility of the topic.

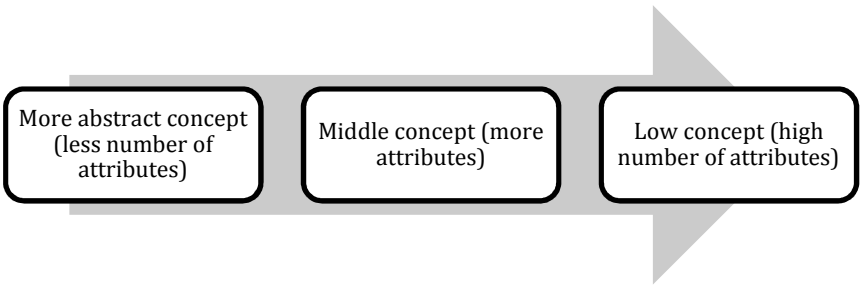
5.6. Operationalization of the concepts

The levels of comparability of a study working with secondary data depend on how concepts were operationalized. Indeed, how those in-charge of designing questionnaires understood the core concepts and the objective of their study, has implications for the comparability of any given study. One main issue designing a comparative study is how concepts are operationalized into variables and how flexible the definition is (Giocanni Sartori, 1970). In a comparative variable-

oriented design, using secondary data from five different LA countries, it was expected that there would have been differences in how questions were asked in each survey and that these differences had an effect on data comparability.

Different procedures to correctly operationalize a concept have been proposed. Giocanni Sartori (1970) suggested a method to work with concepts in comparative studies and to include new cases without falling into *"conceptual stretching*" (p.1034). Following his suggestions the concepts can be divided into three main levels (Figure 6.3) that differ in the number of attributes that each concept includes.

FIGURE 6. 3. LEVELS OF THE CONCEPTS



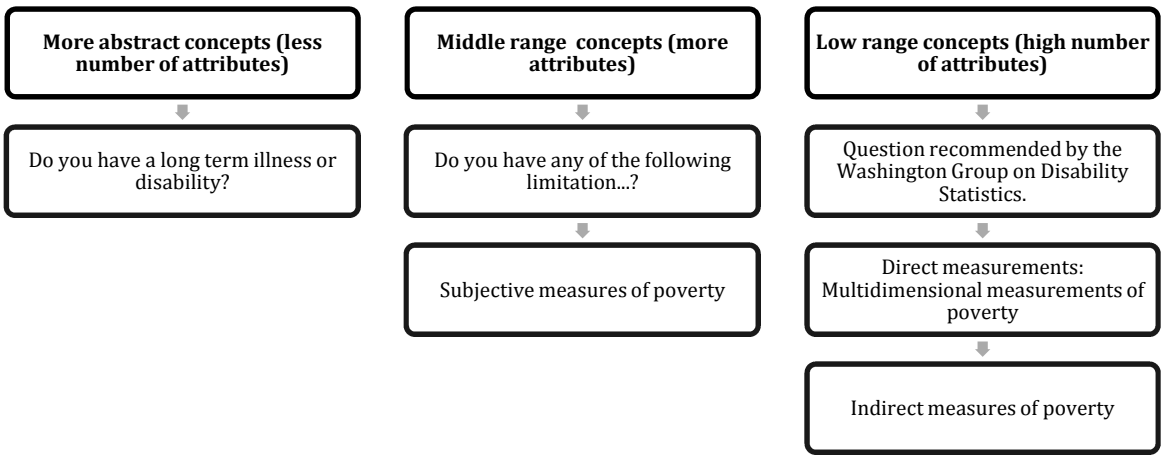
For this study the operationalization of the concepts followed a similar rationale. In the case of disability, the more abstract concept was related to questions that only asked about a long term illness or disabilities. Middle range concepts were obtained from questions that included the existence of different types of impairments or limitations, and low range concepts were obtained from questions that included information about type of impairment, severity and time spectrum. Although this does not allow a perfect comparison of concepts, it allows an analysis of disability. The number of attributes included in each concept influences the results of this study, but in order to include variables as similar as possible all

concepts were operationalized using the same rationale. This study is based on the assumption that questions included in surveys and censuses aim to identify the prevalence of disability in a country.

In the case of poverty, concepts were operationalized depending on the information included in each source of information. In most cases, information responded to methods used by national government. As was discussed in chapter 2, poverty can be measured using direct and indirect methods; the former uses multidimensional measures such as UBN or the MPI; the latter uses poverty lines as the main measure. In the case of this concept, only middle and low concepts were included in the analysis.

Figure 6.4 presents the rationale of the operationalization of the concepts of disability and poverty in this study. In the following two sections an analysis of the complexity (and implications of different definitions) of disability and poverty will be presented.

FIGURE 6. 4. RATIONALE OF OPERATIONALIZING THE CONCEPTS



In conclusion, the approach proposed by Giocanni Sartori (1970) allows the inclusion of concepts with different definitions, but aims to measure the same phenomena (Giovanni Sartori, 1991). In the case of disability and poverty, the definition of type and number of attributes included in each level depended on aspects associated with how countries defined each category. In the next sections, a discussion related to the operationalization of these concepts is presented in more detail.

5.6.1. DISABILITY

As was discussed in chapter 3, different theoretical models to define disability have been proposed in the literature. Each understands and includes a diverse set of characteristics. The most important examples are the individual, the social and the ICF model of disability[17]. How disability is defined and understood plays a major role when the objective is to implement a valid and reliable measure. Each model has proposed different measures and depending on that which is implemented, the number of people identified as disabled will change (Altman, 2001a, Benitez-Silva et al., 2004, Grönvik, 2009, Mont, 2007a, b, Palmer and Harley, 2011). As a consequence, a pure comparative analysis is impractical, given that each measure captures different populations.

Low range concepts include the six questions developed by the WG. These questions include a scale of severity aspect that allows a more detailed analysis of how disability affects the levels of poverty for individuals with different impairments (and at different levels of severity). Social and participation factors

[17] In chapter 3 the definition of disability was also discussed, however, given the difficulties to operationalize the model based on this approach, in this section it is not considered.

are not directly measured by these questions, instead, levels of social, political and economic participation should be analysed based on the type, severity and complexity of the impairments (Palmer and Harley, 2011, Washington City Group (WG), 2009).

In the context of this study, finding a definition that represents and captures the real magnitude of disability was a key issue. However, data limitations and the fact that surveys did not include the WG questions influenced the level of comparability of each measure. Nevertheless, disability is a concept and most importantly a social situation that should be studied, and analysing the relationship between disability and poverty should not be limited for the lack of comparable data. Indeed, this should be an opportunity to analyse the concept of disability using different levels of analysis of a concept and to establish if the relationship between disability and poverty changes according to the measure of disability or, instead, if a robust result exists regardless of the specific wording of the question asked.

Annex 6.1 presents how questions on disability were operationalized in each survey. In the process differences between the questions included by each survey were acknowledged and it was recognized that in most cases a similar set of questions to those proposed by the WG was used.

5.6.2. POVERTY

As was discussed in chapter 2, the definition of poverty is always associated with a specific methodology of measurement. Direct measures have been proposed as an attempt to incorporate more than just an income dimension. However, the poverty

line continues to be one of the most used measures of poverty and the 1.25 and 2 US dollars per day[18] levels are still broadly used around the world.

Different analyses have been conducted, looking to compare a diverse number of measures of poverty and the population that each of them capture (Jean Olson Lanjouw and Lanjouw, 1997, Ruggeri et al., 2003, Stewart et al., 2007, Walker et al., 2012). Most studies concluded that each measure captures a different proportion of the population and depending on several decisions the percentage of the population classified as poor is different. These differences have implications for the analysis of the relationship between poverty and disability. Given that depending on what measure is used, the percentage of those families with disabled members classified as poor will vary. Additionally, indirect measures of poverty usually do not capture the extra cost of disability, ignore economic implications of disability and how economic conditions change when a person becomes disabled (Kuklys, 2005, Trani et al., 2011a).

The five countries included in this study have asked questions in national surveys in order to calculate poverty rates. Brazil, Chile and Mexico included information related to indirect measures of poverty. Colombia included subjective poverty measures and Costa Rica UBN. Table 6.6 presents the variable used in each case to construct a measure of poverty. In chapter 7 a detailed discussion of how poverty was measured in each survey and year will be presented.

[18] This is the absolute poverty line proposed by the WB since the 2008 (Haughton and Khandker, 2009)

TABLE 6. 6. POVERTY VARIABLES AND MEASURES

Country	Variable	Measure
Brazil	Income	Indirect measure Poverty Line
Chile	Income-consumption	Poverty line according to basic consumption basket
Colombia	Do you consider yourself and your family poor? Yes/no	Subjective measure of poverty
Costa Rica	Unsatisfied basic needs	Unsatisfied basic needs index (five dimensions)
Mexico	Income	Monthly family income

5.7. MEASUREMENT ERROR

In the analysis of any type of survey difficulties associated with measurement error should be considered. Indeed, in the process of planning, design and implementing surveys, different sources of error exist. Those sources have a negative effect on the validity of the measures, the estimators and until what point the results can be generalized. Errors associated with the respondent are related to differences between individuals included in the sample and the population. Although sampling frames aim to include a representative proportion of the population and individuals included should mirror population characteristics, in some cases, sampling errors exist. Nevertheless, this error is random and it decreases when sample size increases (Fowler, 2014).

Bias is another common type of error in survey methodology. Three sources of bias can be found: 1. when specific population groups or areas (regions) of a country are not included in the sampling frame; 2. when the process of selection of participants is not random and 3. when data from all observations are not properly collected; this usually happens in high level income households, which tend to be underrepresented in national household surveys (Fowler, 2014). Contrary to

sampling errors, bias is a problem that affects the quality of the estimates and reduces their consistence.

Additionally, four sources of measurement error exist: 1. the questionnaire; 2. the data collection method; 3. the interviewer and 4. the respondent (UN, 2005b). An inappropriate questionnaire design can cause measurement problems related to how concepts are operationalized and up to what point questions are able to capture the concept they represent. Aspects associated with question wording, question length, questionnaire length, question order and the questionnaire format are sources of error in a questionnaire. The data collection method also can reduce or increase the level of measurement error, indeed the use of face to face questionnaires increases the question response rate, but also using this type of method can create disincentives to answer questions truthfully. The interviewer plays an important role in the way questions are asked and how individuals understand them; training and constant supervision can reduce errors associated with the interviewer and increase the validity of the sample. Finally, the fourth source of measurement error is the responder, who can misunderstand the question or hide information and s/he is affected by social desirability bias (UN, 2005b).

All sources of measurement error play an important role when concepts such as disability and poverty are the centre of analysis. Indeed, in the case of disability during the last decade, the WG has been tested and analysed different questionnaires on this topic; in order to determine which questions capture the current accepted concept of disability and can be used in different languages and

cultural settings. The main objective of this on-going discussion has been to create a comparable and valid measure on disability (Altman, 2011, Altman and Barnartt, 2006). It is not only aspects of questionnaire design that are a source of measurement error in the case of disability, but also how interviewers understand disability and their attitudes toward disabled people are relevant sources of error. Additionally, the use of proxy responders is an important and common cause of measurement error, when questions are asked to people to answer on behalf of others with mental/ cognitive or sensory impairments. The WG has made different suggestions, aiming to reduce the sources of measurement error, some are related to appropriate training of the interviewers and the inclusion of a validated set of questions in household surveys (WG, 2013a).

In the case of poverty, its definition is closely associated with how it is measured and under what characteristics individuals are considered poor or not. Different types of objective (direct and indirect approaches) and subjective measures have been included in national household surveys or have been calculated with information from these sources. In general, when subjective measures of poverty are included, aspects such as adaptive preferences play an important role and can increase the measurement error (Ravallion, 2012). However, this aspect should be addressed during the questionnaire design phase; usually, objective measures of poverty are more common and a large set of questions are included in household surveys in order to create these measures. Given that the analysis of poverty is usually an important point for governments, in most cases sources of measurement error are low or almost zero (Bradshaw and Finch, 2003, Stewart et al., 2007).

In conclusion, four sources of measurement error exist and are related to questionnaires, data collection mechanisms, interviewers and responders. As a consequence of difficulties in the operationalization of the concept of disability, it is expected that questions on this topic have high levels of measurement error and in some cases do not capture the complex reality of disability.

6. Ethical Considerations

In the analysis of secondary data there are not as many ethical implications than when primary data is collected. However, in the analysis of any source of data there are ethical principles that a researcher should follow, such as how the data is managed, how causal results are presented and how missing data affects the quality of the research. Firstly, how the data is treated and how variables change should be explained, in order to demonstrate that the results correspond to the reality; and a discussion about the basic assumptions that the researcher made and how those affect the analysis of the results must be understood by the reader (Panter and Seba, 2011).

Moreover, when causal relationships are analysed using secondary data, the research should distinguish between association and causation. Indeed, what limitations and advantages there are working with this type of data and how direct and indirect effects play a role. Given that observational data cannot provide enough information about a causal phenomenon, because it is not possible to control all the factors, it is necessary to explain to what extent the result can be read as evidence of a causal effect (Panter and Seba, 2011).

Finally, missing values can affect the quality of the data, especially when those are associated with individual or regional characteristics. In that case, it is necessary to explain what implications this has on the results and how the analysis does not represent the reality of a specific group or region. Although, this can have a negative effect on the quality of a research, it should be discussed as a fundamental part of the data management and analysis (Panter and Seba, 2011).

Another important ethical aspect that should be considered when using secondary data is related to the consent used in the original survey. Indeed, in most cases when individuals agree to participate in a survey, they do not understand that the information can be used for different purposes. Therefore, it is important to establish if informed consent included the use and analysis of the information in secondary analysis (Grinyer, 2009).

In conclusion, a researcher working with secondary data should present, explain and discuss how the data was managed, what assumptions were made and how the quality of the data affected to what extent the results can represent the reality of a population.

7. CONCLUSION

The purpose of this research is to provide empirical evidence of how disability affects the levels of poverty for a household in LA, aiming to fulfil this overarching objective four specific research questions were proposed and a small-N comparative variable oriented design using most different cases and a cross-sectional design were implemented. Following a post-positivist epistemology and a

hypothetico-deductive rationale of inquiry this study tests the hypothesis *households with disabled members have a higher risk of poverty compared with households without disabilities*. In order to test this hypothesis, five LA countries were selected following a three stage selection process, with criteria related to socioeconomic characteristics and data availability. The main sources of data are household surveys and population and household censuses. In Chile, Colombia and Mexico a time dimension was added in order to increase the internal validity of the study and compare changes within countries. The operationalization of the concepts followed the method suggested by Sartori. In the case of disability, questions included in surveys and censuses were divided into three levels according to the number of attributes. For poverty, questions were assigned to middle and low range concepts depending on the numbers of attributes.

8. ANNEX 6.1 DEFINITIONS OF DISABILITY

TABLE 6. 7 DEFINITIONS OF DISABILITY INCLUDED IN EACH SURVEY AND YEAR

Country	Survey	Question used	Description variables
Brazil	Pesquisa Nacional por Amostra de Domicilios (PNAD)	This survey included different questions related to daily life activities and mobility limitations. It included questions in a sequence, in other words those individuals that refer to live with a mild or not live with any type of ADL had the opinion to answer questions related to mobility	In this case two types of variables were created: 1. Moderate to severe ADL limitation: Dichotomous variable that took the value of 1 if the person was living with this condition and 0 otherwise. 2. Moderate to severe mobility limitation: Dichotomous variable that took values of 1 if the person was living with this condition and 0 otherwise.
	Census 2010	The Census includes four questions on visual, hearing, physical and mental/cognitive impairments. Each question includes four options for severity	In this case, households with members that answered yes to middle to severe options were included in the analysis.
Chile	Encuesta de Caracterización Socio-económica (CASEN) 2006	Do you have any of the follow long term conditions? • Blindness or visual difficulty even when you use glasses • Deafness or hearing difficulty even when you use hearing aid • Muteness or speaking difficulties • Physical or difficulty to move • Mental or intellectual difficulty • Psychic or psychiatric difficulty • No long term difficulty	If a member of the household responded yes to this question, the household will be classified as household with disabled members.
	Caracterizacion Socio-economica (CASEN) 2009	Do you have any of the follow permanent condition or long term condition? • Physical or mobility difficulty • Difficulty to speak • Psychiatric difficulty • Mental or intellectual difficulty • Deafness of hearing difficulty even when you are using hearing aids • Blindness or visual difficulty even when you are using glasses • No long term difficulty	If a member of the household responded yes to this question, the household will be classified as household with disabled members.
	Caracterizacion Socio-economica (CASEN) 2011	Do you have any of the follow permanent condition or long term condition?	If a member of the household responded yes to this question, the

		• Physical or mobility difficulty • Difficulty to speak • Psychiatric difficulty • Mental or intellectual difficulty • Deafness of hearing difficulty even when you are using hearing aids • Blindness or visual difficulty even when you are using glasses No long term difficulty	household will be classified as household with disabled members.
	Household Census 2001	Do you have any of the following impairments: • Totally blind • Totally deaf • Not able to speak • Physical Paralyse • Mental illness	If a member of the household responded yes to any of the options, the household will be classified as household with disabled members.
Colombia	Encuesta de calidad de vida 2008	In this household there are members with one of the follow limitations	In this survey the question related to disability was included at the household level. In this case a variable named disability that took values of 1 if there was at least one member with disability in the household and 0 if not.
	Encuesta de calidad de vida 2010	Do you have any of the following limitations:	As a result that in this survey they included information related to disability at the individual level it was possible to create a variable related to each type of limitation or impairment.
	Encuesta de calidad de vida 2011	In this household there are members with one of the follow limitations	In this survey the question related to disability was included at the household level. In this case a variable named disability that took values of 1 if there was at least one member with disability in the household and 0 if not.
	Household census 2005	Questionnaire recommended by the WG.	If a member of the household responded yes to this question, the household will be classified as household with disabled members.
Costa Rica	Household census 2001	Do you have a permanent impairment such as… Total or partial blindness Total or partial deafness Mental retardation	If a member of the household responded yes to this question, the household will be classified as household

		Paralysis or amputation Mental disorders Other…?	with disabled members.
Mexico	Encuesta Nacional de Ingresos y Gastos de Hogares ENIGH 2008	In this household there is a person with disability? (limitation to move, walk, use the arms or legs, a blind person, deaf or mute, mentally retarded or with a mental impairment) Yes No	If a member of the household responded yes to this question, the household will be classified as household with disabled members.
	Encuesta Nacional de Ingresos y Gastos de Hogares ENIGH 2010	In your daily living … do you have any difficulty …? To walk, to move or to go down and upstairs? To see, even when you are using glasses? To speak, to communicate or to have a conversation? To hear, even when you are using a hearing aid? To take a shower, to get dressed, or to eat? To pay attention or to learn simple things? Do you have any mental impairment? You do not have any physical or mental difficulty	If a member of the household responded yes to this question, the household will be classified as household with disabled members.
	Encuesta Nacional de Ingresos y Gastos de Hogares ENIGH 2012	In your daily living … do you have any difficulty …? To walk, to move or to go down and upstairs? To see, even when you are using glasses? To speak, to communicate or to have a conversation? To hear, even when you are using a hearing aid? To take a shower, to get dressed, or to eat? To pay attention or to learn simple things? Do you have any mental impairment? You do not have any physical or mental difficulty	If a member of the household responded yes to this question, the household will be classified as household with disabled members.
	Household census 2010	In your daily life, do you have difficulties in doing any of the following activities: • Walking, move • See, even when using glasses • Talking or having a	If a member of the household responded yes to any option, the household will be classified as household with disabled members.

	conversation • Hearing, even using a hearing aid • Getting dressed, taking a shower or eating • Pay attention or learning simple things • Do you have any mental illness

CHAPTER 7

METHODS CROSS-SECTIONAL ANALYSIS

1. INTRODUCTION

As discussed in chapter 6, two types of research design were implemented in this study. This chapter presents the methods used for the cross-section analysis. The main aims of the chapter are to present the specifications of the econometric model, detail each of the sources of information and lastly to discuss the descriptive statistics of each sample.

The cross-sectional design aims to analyse how levels of poverty differ between households with and without disabled members in five LA countries. This analysis was conducted for three different years in Colombia, Chile and Mexico and for a single year in Brazil and Costa Rica. Two main criteria were considered to select the years for analysis: availability of data related to living standards or indirect measures of poverty (subjective or income) and existence of data related to disability. This last aspect was vital; given that the inclusion of questions on disability has been limited in household surveys.

In order to allow for comparison between countries all econometric models were estimated at the household level. Additionally, similar explanatory variables were included in all the cases (if it was possible). All models incorporated, as the explanatory variable, the presence of at least one member with disability in the household; this was the variable of interest and the object of analysis. Given that in

some countries disability questions were asked at the household level, it was not possible to define the number of members with disability in a household or their role in the family (head of household, partner, child, other). Nevertheless, in cases where it was possible, a variable related to head of the household with disability was included.

The main econometric model included seven sets of variables: i. household characteristics, ii. region, iii. urban area, iv. characteristics head of the household, v. household ownership, vi. asset index and vii. other variables. In the last group, variables related to health care insurance, social assistance, food security and school attendance were included, depending on the availability of data in each country. In all of the eleven data sets used, listwise deletion was the technique to manage missing values, meaning that observations with missing values in the variables of analysis were deleted from the sample. In all cases, a small percentage of the sample was discarded, and representativeness of the data was not compromised.

Next in this chapter, the level of analysis used in this study is described, followed by a description of the main econometric model estimated. I will detail which variables were included as dependent and independent, provide an account of the management of missing values and provide information on the data sources used in this study. Details of how the data was managed in each country are presented in appendix two to six of the thesis.

2. LEVEL OF ANALYSIS

In order to analyse the effect of the presence of a member with a disability, on the levels of poverty in a household, information from all the surveys was analysed at the household level. It has been identified that the extra costs of disability have a negative impact on the levels of income and consumption of individuals and their families. In cases when a family has at least one member with disability, direct (medical, technical aids, etc.), indirect (care and loss of income because of time spent caring) and opportunity (no access to labour opportunities) costs are assumed for the family (Kuklys, 2005). Moreover, family roles can change according to who lives with disability and when s/he became disabled. Finally, levels of consumption of a family are determined by individual characteristics and needs, those include age, sex, ethnic group, disability, education level and economic activity.

Additionally, in countries such as Colombia and Mexico, questions on disability were asked at the household level. This aspect did not allow for analysis of the characteristics of individuals with disability, and how different impairments and severities affect access to basic services such as health and education. Given the importance of comparing between and within countries, and aiming to identify if levels of poverty in a household were affected by the presence of at least one or more members with disability, it was decided, given data constrains, that the household was the most appropriate level of analysis.

3. ECONOMETRIC MODEL

An econometric model including seven different groups of independent variables was estimated, using the information from each country and year included in the analysis. Each group of independent variables represented different characteristics that have been identified as factors that increase or decrease levels of poverty in a household. Although, for each country and survey a similar econometric model was estimated; the final model varied depending on the available data.

$$Poverty = \beta_0 + \beta_1(HCH) + \beta_2\,(Area) + \beta_3\,(Region) + \beta_4(HHCH)\beta_5\,(AI)\beta_6\,(HO)\beta_7\,(Others) + \varepsilon_i$$

HCH: Household composition characteristics

Area: Urban or rural area

Region: Regions of each country

HHCH: Head of the household characteristics

AI: 40% poorest according to the asset index

HO: Housing ownership

Others: Depending on the country and the year of the survey, variables related to school attendance of children of school age; food security; health care insurance and access to social assistance programmes were included.

$\boldsymbol{\varepsilon_i}$**:** Residual

A detailed description of all variables included in each econometric model per country and year is presented in the appendix for each country. This section presents a general description of the transformation implemented in relation to each variable.

3.1. MODELLING

At the first stage a theoretical model was defined. This model included all groups of independent variables explained in the previous section. In the following stage, based on the data available in each survey and country, a number of extra independent variables were selected. Finally, during the estimations a specific to general approach was followed (bottom-up). Although the top-down approach is recommended and commonly use in econometrics, most applied econometricians use the bottom- up approach starting from a simple model to a more complex model as recognised by Magnus (1999).

Additionally, this study aims to test the effect of the presence of a member with disability on the levels of poverty (subjective or objective) in a household. In this context, it was important to see how this variable changed when others were included and if the effect was the same in all the specifications of the model.

4. DEPENDENT VARIABLES

Different types of dependent variables were included in the analysis. Given data limitations, it was not possible to include the same measure of poverty in all the countries. Indeed, not all the countries had information on income or consumption. Brazil, Chile and Mexico had information on monthly household income; aiming to use this information as a dependent variable and to improve their distributional characteristics (skewness and kurtosis) a logarithmic transformation was implemented. Additionally, in Brazil and Chile, it was possible to use the official national measure of poverty as a dependent variable, in a second estimation. A

subjective perception of poverty was the dependent variable for Colombia and the index of UBN was the dependent variable for Costa Rica (Table 7.1).

TABLE 7. 1. DEPENDENT VARIABLES PER COUNTRY AND YEAR

Country	Year	Dependent variable	Description of the variable
Brazil	2008 Pesquisa Nacional por Amostra de Domicilios-PNAD	Natural Logarithm of household income	Variable created using the total income of the household, which is the total sum of labour income, rents, pensions and benefits from social assistance programmes.
		Official minimum monthly wage classification	Ordinal variable that classifies households in three groups according to their level of income and the minimum national wage for 2008; assuming equal distribution of income among all members of the household
Chile	2006 2009 2011	Official measure of poverty	Dichotomous variable with value equal to 1 when the person is poor or extra-poor and 0 if s/he is not poor
	2006 2009 2011	Natural Logarithm of household income	Natural logarithm of the income at the household level, which is the result of the sum of autonomous family income, income transference, an imputation of other sources of income (e.g. rent of dwelling).
Colombia	2008 2010 2011	Subjective poverty	Dichotomous variable with value equal than 1 if the household is considered poor and 0 if not
Costa Rica	Census 2000	Unsatisfied basic needs	Variable that represent if a household has or not unsatisfied basic needs. The variable takes values between zero and four. The four dimensions are: Access to dwelling; access to basic sanitary services; access to education and economic capacity of the household
Mexico	2008 2010 2012	Natural Logarithm of household income	This variable was created using the total income of the households, which was the total sum of all the sources of income that a household had, including labour income, rents, pensions and benefits from social assistance programmes

5. INDEPENDENT VARIABLES

5.1. HOUSEHOLD CHARACTERISTICS

This group included variables that according to the literature can directly impact the levels of poverty in a household (Lipton and Ravallion, 2008).

- Existence of a member with disability: Dummy variable that represented the existence of a member with disability in the household. Given that questions related to disability differed between countries and in some cases were asked at the household level, it was not possible to identify how many members with disability the household had or the type of impairment.
- Number of children (members younger than 12 years old): Continuous variable that represented the number of children per household.
- Number of elderly members (older than 65 years old): Continuous variable that represented the number of elderly individuals in a household.
- Number of working members: Continuous variable that represented the number of working individuals[19] receiving a salary in the previous week of the interview.
- Size of the household: Continuous variable that represented the number of members per household. In some countries, the square of size of the household was included given previous evidence of the importance of this variable in the levels of poverty in a household (Francisco H. G. Ferreira et al., 2010, Peter Lanjouw and Ravallion, 1995).

5.2. Area and Region

These two groups of variables included information about aspects associated with the area and region where the household was situated. In all the countries and surveys rural areas were the reference category for area, and in the case of region,

[19] People answering questions related to work varied between countries. This variable was created using the information of the question "Did you work during the last week?". In general individuals older than 12 years old would answer this question.

in each country a specific region was selected to be the reference category (see appendix 2 to 6 for details).

5.3. HEAD OF HOUSEHOLD CHARACTERISTICS

Variables included in this group were related to important characteristics of the head of the household. The definition of head of household was similar in all countries; it was associated with the person who was recognised as the head for all other members of the household. According to the literature the level of education, type of economic activity, age and gender of the head are important determinants for levels of poverty of a household (Lipton and Ravallion, 2008, The World Bank, 2001). The following variables were included in the econometric analysis:

- Age of head of household: Continuous variable that represented the age of the person identified as the head of the household.
- Age squared of head of household
- Female head of household: Dichotomous variable that represented when a household had a female head.
- Level of education of head household: Dichotomous variables that represented the level of education of the head. The reference category was no education level and the definition of the education levels varied between countries.
- Working head of household: Dichotomous variable that represented if the head was working and earning a salary in the week previous to the survey.

- Head of household marital status: Dichotomous variables that represent the marital status of the head of household. Single head of the household was the reference variable.
- Head of household with disability*:* In countries and surveys where information on disability was asked at the individual level, it was possible to identify if the head of the household was disabled or not. In those cases, a dichotomous variable was created in order to analyse how levels of poverty changed if the head of the household was disabled or was not disabled.

5.4. ASSET INDEX

The index was created using Principal Component Analysis, and following the methodology implemented by Filmer and Pritchett (2001). The first component was chosen as the asset index and households were divided into two groups, those living with a level lower or equal than 40% of the asset index (poor) and above the 40% (not poor)[20]. Variables included in the asset index were related to dwelling characteristics (floors and walls material; cooking fuel; source of water to cook; sanitation services and rubbish collection) and asset ownership, depending of the available information in each country a different list of assets was included in the analysis.

Table 7.2 presents the percentage of variance explained by the first component in each country and survey. A detailed explanation of variables and the effect of each variable on the asset index are presented in the appendix of each country.

[20] This value was selected following Filmer and Pritchett.

TABLE 7. 2. ASSET INDEX PER COUNTRY AND SURVEY

Country	Year	% of variance explained by first component
Brazil	2008	13.5%
Chile	2006	19%
	2009	15.3%
	2011	17%
Colombia	2008	20.3%
	2010	18.3%
	2011	21.4%
Costa Rica	2000	14.3%
Mexico	2008	17.8%
	2010	18.22%
	2012	15.0%

5.5. HOUSING OWNERSHIP

The ownership of important assets such as the dwelling decreases the risk of poverty that individuals face and helps to reduce the impact of negative shocks on the levels of income or consumption of a household (Shapiro and Wolff, 2005). This group of variables included three types of housing ownership:

- *Own the property:* this variable included those households that owned their homes completely or were paying the mortgage of the house they were living in.
- *Rent the property*: Households paying rent were included in this category.
- *Borrow the property and other:* This variable included all households who were living in a flat or house that was given by a company or other entity and other options related to ownership of the household were included in this variable.

5.6. OTHER VARIABLES

In general, other factors have been recognised as influential on the levels of poverty of a household. Some are related to food insecurity, school attendance of

children of school age, child work, access to social assistance programmes and type of health insurance. In each country other variables were included, depending on data availability. Table 7.3 presents a description of the extra variables included per country and year.

TABLE 7. 3. OTHER INDEPENDENT VARIABLES INCLUDED IN THE ANALYSIS

Country	**Year**	**Additional variables included**	**Description of the variable**
Brazil	2008	No school attendance	Dichotomous variable with values equal to 1 when the household had one or more children in school age not attending to school.
		Child work	Dichotomous variable with values equal to 1 when the household had one or more children working
		Disability and poorest 40%	Dichotomous variable that represents that a household had at least one member with severe or moderate ADL or mobility impairments and was in the poorest 40% according to the asset index.
Chile	2006	No school attendance	Dichotomous variable with value equal to 1 if the person was living in a household with at least one school age child not attending to school.
	2009 2011	Chile Solidario	Dichotomous variable with value equal to 1 when the household is receiving money transference from the programme Chile Solidario and 0 if not.
		Poverty*disability	Dichotomous variable that took the value of 1 when the person was living in a household that was poor according to the asset index and had at least one member with disability.
Colombia	2008	Food insecurity	Dichotomous variable that takes the value of 1 when at least one adult of the household was hungry but did not eat, because of monetary restrictions. This is considered to be moderate food insecurity according to the Food and Agriculture Organization of the United Nations (FAO)
		Health insurance	Subsidized regime Contributory regime Special regime No health care insurance
		Social Assistance	Dichotomous variable that took the value of 1 when at least on member of the household received a social assistance benefit (familias en accion) and 0 otherwise
	2010 and 2011 In addition to the ones included in	Social assistance	*Familias en accion:* Dichotomous variable that took the value of 1 when a member of the family was receiving this subsidy and 0 if not. *Old age pension:* Dichotomous variable that took the value of 1 when a person older than 65 years

	2008		old in a household was receiving this pension and 0 in other cases.
Costa Rica	Census 2000		No additional variables
Mexico	2008 2010 2012	Food insecurity	Dichotomous variable that took the value of 1 when at least one adult of the household was hungry but did not eat for money reasons. This is considered to be moderate food insecurity according to the Food and Agriculture Organization of the United Nations (FAO).
		No school attendance	Dichotomous variable with value equal to 1 if the person was living in a household with at least one school age children not attending to school.

6. MISSING VALUES

The technique to manage missing values was listwise deletion; this approach discards information from cases with one or more missing values (Enders, 2010). This method allows the calculation of unbiased estimators and correct standard errors, if the probability of missing values in one variable does not depend on other variables (Allison, 2001). Prior to implementing listwise deletion, an analysis of the variables with missing values was conducted, with the purpose to verify if missing values were completely random. In all countries and surveys, missing values were not related to individual or demographic characteristics such as sex, age, region or area of residence; these findings therefore justified the use of listwise deletion.

Additionally, in the cases of Brazil, Chile and Mexico, where the dependent variable was a logarithmic transformation of household income, missing values were created if the original values were zero or negative. As in the other cases, listwise deletion was used to manage missing values. It is acknowledged that deletion of those observations increased the variance of the sample (Johnson and Rausser, 1971). However, all surveys included in this study had a large sample size;

therefore the estimates obtained are efficient and represent population values. Table 7.4 presents the percentage of missing values in each of the surveys included in the analysis.

TABLE 7. 4. SAMPLE SIZE BEFORE AND AFTER LISTWISE DELETION

Country	Year	Total Size	Percentage missing values
Brazil	2008	391,868	Missing other variables <1% Missing logarithm income <5%
Chile	2006	268,873	1.9%
	2009	246,924	2.3%
	2011	200,302	0.1%
Colombia	2008	50,419	1.6%
	2010	53,453	1.4%
	2011	92,188	1.4%
Costa Rica	2000	381,500	3.6%
Mexico	2008	118,927	1.8%
	2010	107,781	2.0%
	2012	33,726	0.3%

7. ECONOMETRIC ANALYSIS

Different econometric techniques were used in order to estimate the effect of disability on the levels of poverty of households in each country. As was mentioned before, dependent variables differ between countries. In cases where the natural logarithm of income was the dependent variable, ordinary least square (OLS) was used as estimation method. On the other hand, when the dependent variable was ordinal, such as in Costa Rica and Brazil, an ordered response model (ordered logit) was estimated; in the cases where the parallel regression assumption was violated, different transformation of the dependent variables were implemented, with the purpose of estimating either a binary outcome model or a generalized ordered logit model. Finally, when the dependent variable was dichotomous (e.g. Colombia) a binary outcome model was used (Cameron and Trivedi, 2005).

Cluster robust standard errors were estimated in all the models, in order to correct for heteroscedasticity and correlation between observations. Additionally, this correction allows the calculation of correct standard errors after clustered samples, in order to obtain valid statistical inference. Sampling weights were used for descriptive analysis, however, they were not applied in regression analysis or inference process, since weights were defined using information from the national population censuses and were only functions of independent variables included in the model (e.g. age, sex and region) (Dumouchel and Duncan, 1983, Winship and Radbill, 1994).

Depending on the type of econometric technique estimated, different information criteria and goodness-of-fit measures were calculated and the basic assumptions of each model were tested in each case. Finally, models with the highest explanatory power and the best information criteria were selected. STATA 12 was used as the econometric software for the analysis.

7.1. Ordinal Response Model And Generalized Ordinal logit

An ordinal model outcome allows the analysis of ordered responses. In other words, the values of each option are not arbitrary and indeed, the order plays a role in the analysis (Wooldridge, 2009). The basic assumption behind ordinal response models is the *parallel regression assumption or the proportional odds assumption*. This assumption implies that all betas estimated by the model do not change between alternatives of the dependent variable. When this assumption does not hold, the estimated parameters usually are incorrect, incomplete or

misleading, leading to incorrect analysis and results (Long and Freese, 2001, Williams, 2006).

Different alternatives have been proposed in the literature, the most common are to estimate different binary outcome models; or a multinomial model or a generalized ordinal model (Long and Freese, 2001). The first alternative implies to transform the dependent variable; the second will assume that the categories are unordered and it allows that estimated parameters (βs) change between outcomes. Finally, a generalized ordinal model estimated different coefficients and a constant for each category of the dependent variable (Fu, 1998).

Both, multinomial and generalized ordinal models relax the parallel lines assumption and estimated different parameters per each category in *Y*. Additionally, both are suitable options for the analysis. However, multinomial models tend to estimate a larger number of parameters compared to the generalized ordinal model. In this last model variable(s) that do not violate the assumption of parallel lines are estimated under this assumption, therefore the model is more parsimonious and is preferred (Williams, 2006).

7.2. Average Marginal Effects

Average marginal effects (AME) were calculated, in order to analyse the value of the coefficients of each variable. This allows the analysis of discrete changes of *Y* when *X* increases by one unit, with all other variables constant. The main advantages of calculating AME instead of marginal effects at the mean (MEM), is that when dummy variables are included, the mean of those variable does not have

an appropriate interpretation and indeed it does not provide additional information or meaning (Bartus, 2005, Long and Freese, 2001).

9. DATA SOURCES

9.1. BRAZIL PNAD 2008

The source of data was the annual national household survey of Brazil (*Pesquisa Nacional por Amostra de Domicilios-PNAD)*. The PNAD is collected by the Brazilian geography and statistics institute (Instituto Brasileiro de Geografia e Estatística (IBGE)) and it has been conducted annually since 1967. The main objective of the survey is to produce basic information to analyse the socioeconomic development of Brazil. The information collected every year includes general characteristics of the population, education, employment and housing. Additionally, information on migration, fertility (women older than 10 years old), health, nutrition, child labour (children between 5 and 9 years old) and other topics are collected according to the need. After 2004, the survey is representative in urban and rural areas and large regions of Brazil (Instituto Brasileiro de Geografia e Estatística - IBGE, 2008).

In 2008, the PNAD included three additional sections: health, access to internet and mobile phones and tobacco addiction. For this year, the objectives of the survey included to obtain information on the use of health care services, the existence of physical impairments and on access to preventive medical/health examinations for women (IBGE, 2008).

SAMPLING FRAME

The total population included in the PNAD 2008 was 150,591 households with 391,868 individuals distributed in all the regions of Brazil. The PNAD was collected using a probabilistic sampling of households in three stages. First, primary sampling units (PSU) (municipalities) were selected and classified into two categories: auto-representative and not auto-representative, in the last group, a process of stratification was conducted and each stratum was selected with replacement and a proportional probability was given using information from the 2000 Census. In following stage, second sampling units (SSU) (enumeration areas) were selected in each municipality included in the sample. In the third and final stage, dwellings and collective households were selected from the second sampling units (Ministério de Saúde et al., 2010).

The information was collected during the last quarter of 2008. The day of reference was 27th September and September 2008 was the month of reference. The response rate was 95% at the national level, with the North as the region with the lowest response rate (93.7%) and the highest in the Northeast (96.1%). Additionally, the response rate was higher in rural areas (97.8%) compared with urban areas (94.8%) (IBGE, 2009).

9.2. CHILE CASEN

The source of data was the National Survey for Socioeconomic Characterization (CASEN), which is the main instrument to measure socioeconomic conditions of the Chilean population, and it provides information to design and to implement

national and regional social policies (Ministerio de Desarrollo Social, 2012a). The Ministry of Social Development (before 2011 MIDEPLAN, after 2011 Ministerio de Desarrollo Social) is the national entity in charge of planning, design, collection and analysis of the CASEN.

CASEN has two main objectives. The first is to measure the material well-being, considering dimensions related to income, allowing the development of indicators to measure poverty, income distribution and access to social services. And the second is to provide the necessary information to analyse the efficacy of social policies (coverage, targeting and impact of public spending). The survey has been implemented by the Ministry of Social Development since 1985. It is a biennial survey that collects information at the national and regional level and makes a distinction between urban and rural areas. It is divided into seven modules: i. registration, ii. residents, iii. education, iv. labour, v. income, vi. health and vii. dwelling characteristics. Topics identified as vital for the analysis of the socioeconomic conditions of Chilean population have been included, some examples are: technology, information and communication (TIC); disability; indigenous people, migration, culture; self-report biography and energy consumption (Ministerio de Desarrollo Social, 2012b).

Every year, a pilot is conducted after the final questionnaire is designed, this with the main objective to verify the understanding and comprehension of the questions. A heterogeneous sample that includes households in both rural and urban areas and from different socioeconomic levels is selected to validate the questionnaire during the pilot stage. The information is collected using face to face

interviews with the head of the household, partner or a member of the household older than 18 years old (Ministerio de Planificación (MIDEPLAN), 2006).

9.2.1. 2006

SAMPLING FRAME

For 2006, the sampling framework was a two stage, stratified, cluster sampling. The country was divided in 605 stratums, using a geographic division. The PSU was a section of dwellings, randomly selected and distributed in rural and urban areas. The SSU was composed by randomly selected dwellings. The selection of each PSU was based on the results of the 2002 Census and the minimum size of each section was 100 dwelling(s) for urban areas and 80 dwelling(s) in rural areas (MIDEPLAN, 2006) .

The period of data collection was between 7th November and 20th December 2006. The final sample was 268,873 people, with 89,259 families and 73,720 households. The sample was representative at the national level, both in rural and urban areas and in 335 districts (MIDEPLAN, 2006).

9.2.2. 2009

SAMPLING FRAME

In the year 2009, a similar sampling framework to the one used in 2006 was implemented: two stages, stratified, cluster sampling. The country was divided in 602 stratums and the sample was representative for 334 districts. The sample size for 2009 was 74,339 dwellings. This value was defined using a simple random sampling, with a maximum variance and a confidence level of 95%. The PSU and

SSU were defined as in 2006 (MIDEPLAN, 2009a). In 2009, two new sections were included: Participation and Chile Solidario. As in 2006, the data was collected between November and December, with a response rate of 80.6% at the national level. The final sample was 71,460 dwellings, with 84,956 families and 246,924 individuals. As in the previous year, the sample was representative at the national and regional level, for rural and urban areas and in 334 self-representative districts (MIDEPLAN, 2009a).

9.2.3. 2011

SAMPLING FRAME

Methodological changes were implemented in the design and sampling process of the CASEN in 2011. First, the period of data collection was extended by five weeks, aiming to improve accuracy (from October 2011 to January 2012) (Ministerio de Desarrollo Social, 2012a). Additionally, with the main objective to improve poverty measurements, the sampling framework changed compared to the two previous years. Although, it continued using the main characteristics of a two stage, stratified, cluster sampling; in this year, the sampling frame did not use sections in urban and rural areas. Instead, it used blocks in urban areas and sections in rural areas. The geographic representativeness was given at the national level, in 15 regions and both in urban and rural areas. The selection of the sample was done in two stages in rural areas and three stages in urban areas. The PSU were selected with a probability proportional to the size of each of them, and all SSU had the same probability of selection in the sample (Ministerio de Desarrollo Social, 2012c).

Two samples were selected, the first sub-sample was collected between October and November 2011, and the second period of collection was between November 2011 and January 2012. The last sub-sample was used to calculate the national poverty estimations and it is comparable with data from previous years. For this study the second sub-sample was used. The final total sample included in this study was 200,302 individuals, which were distributed in 70,890 families; 59,084 households and 53,357 dwellings (Ministerio de Desarrollo Social, 2012a).

9.3. COLOMBIA QOLS

The Quality of Life Survey (QoLS) is a cross-section survey, which is conducted by the National Administrative Department of Statistics (Departamento Administrativo Nacional de Estadistica- DANE). The QoLS uses the methodology of LSMS designed by the WB, since 1997. It was first implemented in 1991 in Bogota, and in 1997 it was conducted at the national level, with representativeness in four cities: Bogota, Medellin, Cali and Barranquilla. It is representative at the national level, in large regions and for both urban and rural areas. The main objective of the survey is to obtain information to analyse and to compare socioeconomic conditions of Colombian households, aiming to design and implement public policies. Additionally, the information collected is used to track the MDGs and poverty reduction strategies (DANE, 2008).

Questions are asked at three levels: the dwelling, the household and the individual. The survey is based on the theory of human needs and includes questions related to various domains of life, such as education, health and labour. The target population is civil population not institutionalized living in Colombia. The survey is

divided into different questionnaires, some are always included and other change between years (fertility, food security and ownership of the dwelling). The main sections are: a. identification and control; b. dwelling characteristics; c. household information; d. characteristics and household composition; e. health; f. care of children younger than 5 years old; g. fertility (women 12 and 49 years old);[21] h. education (for all individuals older than 5 years; i. labour (for all individuals 12 years or older; j. food security; [22] k. ownership of the dwelling; m. conditions of life (perception of poverty, of insecurity, vulnerability, disability and ownership of assets); n. household expenditures and o. rural component (DANE, 2009)

9.3.1. 2008

SAMPLING FRAME

The QoLS uses a probabilistic, multistage cluster sampling design. The first stratum was the twenty four principal capitals and metropolitan areas; the second stratum was urban and rural areas. The municipalities were stratified according to geographic criteria, socioeconomic indicators, urbanization, rural-urban structure, proportion of population with UBN and size of the stratum. PSUs were defined using municipalities with a population higher than 7,000. In each stratum, groups of 10 dwellings on average were selected and all households and individuals were interviewed. For the 24 cities, the selection of the sample was conducted in three stages: 1) the SSU were selected using a systematic selection process; 2) using a random process, tertiary units of sampling were chosen and 3) within each of those units a segment was selected (DANE, 2009).

[21] Questionnaire was not included in 2010 or 2011
[22] Questionnaire was not included in 2010 or 2011

The data was collected between 11th August and 18th October 2008. The response rate was higher than 95% in most cases and in cases with levels lower than 92% corrective actions were implemented. In 2008, the QoLS included 13,111 dwellings, 13,611 households and 50,419 individuals. The individual observations included people from 0 to 103 years old.

9.3.2. 2010

SAMPLING FRAME

In 2010, the QoLS collected information from nine regions of Colombia: Bogota D.C., Antioquia, Valle, Atlantic Region, Central Region, Pacific Region, San Andres and Orinoquia-Amozonia. The same sampling frame used in 2008 was implemented in this year (probabilistic, multistage cluster sampling design). The information was collected between August and October, and similar to the previous year the response rates were higher than 95%. In 2010 a new questionnaire on social mobility was included, instead of the food security (DANE, 2010). The QoLS in 2010 included 14,268 dwellings; 14,801 households and 53,453 individuals (from 0 to 102 years old).

9.3.3. 2011

SAMPLING FRAME

The QoLS in 2011 followed a similar approach to that in 2008 and 2010. For this year, the survey was representative at the national level, urban and rural areas and for the same large regions of the previous year. Additionally, the Guajira, Cordoba, Boyacá, Cauca, Choco and Nariño were also representative. As in the previous years a probabilistic, multistage cluster sampling frame was implemented and the

interviews were conducted between August and October (DANE, 2011). The QoLS in 2011 included 24,557 dwellings; 25,364 households and recorder data on 92,188 individuals (from 0 to 108 years old).

9.4. COSTA RICA CENSUS

The source of data was the National Population and Dwelling Census in 2000. The information analysed corresponded to 10% of the population included in the Census 2000. It was obtained in the Integrated Public use Microdata Series (IPUMS) international. The design, planning and implementation of the census were carried out in three stages. The first stage included all the design process, defining the instruments of collection and how the data was going to be processed. The second stage included data collection, which was done during the last week of June 2000. Finally, the last stage included the analysis of the data, the verification of the quality of the information and the evaluation of the questionnaires and the manual of coding (Instituto Nacional de Estadistica y Censos (INEC), 2004).

The questionnaires included information related to sociodemographic conditions, education and economic characteristics of the population and characteristics of the dwelling. Individuals were interviewed in their homes and people living in collective institutions were also interviewed. Institutions included: prisons, monasteries, nursery homes, orphanages and other types of collective institutions. The data was collected on the 28th June 2000. The total population included in the 10% extract was 381,500 observations.

8.5. MEXICO ENIGH

The source of data was the National Survey of Household Income and Expenditures (Encuesta Nacional de Ingresos y Gastos de Hogares ENIGH) 2008, 2010 and 2012. The ENIGH has been implemented since 1984, with a biennial periodicity by the National Institute of Statistics and Geography (Intituto Nacional de Estadistica y Geografia- INEGI) of Mexico. The survey is representative at the national level and the sample is expanded for a specific number of States in each year. The main objective of the ENIGH is to offer a statistical overview of levels of income and consumption of Mexican households. In addition, it aims to provide information about sociodemographic characteristics of each family member and the characteristics of dwellings and assets ownership (INEGI, 2008a). The units of analysis used are dwellings, households and individuals in a household.

The ENIGH is composed of 13 sections, they are: a. dwelling characteristics; b. expenditures of the household; c. capital expenditures per household; d. diary expenditures in food, drinks, cigarettes and transportation; e. expenditures by the household covered using credit cards; f. no monetary income (or expenditures) by the household and each member of the household; g. principal variables at the household level; h. sociodemographic characteristics and occupational of each member of the household; i. expenditures related to education for each member of the household; j. income of each member of the household; k. working activities members older than 12 years; l. income and expenditures in business of the household related to agricultural activities; and m. income and expenditures related to industrial activities.

8.5.1. 2008

SAMPLING FRAME

The sampling design was probabilistic and the information was collected using a geographic stratification and clustering; using a three stages process. In the first stage, four stratums were created, each stratum grouped all the PSUs; then each PSU was assigned to a geographic stratum and finally within each area and demographic stratum, a new stratification process was conducted using some PSU. At the end, 888 sub-stratums levels were created (INEGI, 2008b). In 2008, 35,146 dwellings were selected. Seven states increased their sample by 3,000 dwellings: Mexico, Jalisco, Yucatan, Sonora, Queretaro and Distrito Federal. Additionally, Guanajuato increased the sample size by 2,000 dwelling, an aspect that made the sample for this state representative (INEGI, 2008b) .

The non-response rate was 17.7%; with 8.7% of non-responses for inhabited dwellings and 7.8% for uninhabited dwellings. The information was collected in nine stages, each of them done in ten days. The starting date was 21st August 2008 and it finished on the 17th November 2008. Two more additional periods were used in order to trial the collection of information and to collect information of incomplete questionnaires (INEGI, 2008b).

8.5.2. 2010

SAMPLING FRAME

The sampling frame was probabilistic three stages, stratified, clustered sampling, where the unit of selection was the dwelling and the unit of observation was the

household. It was designed to be representative at the national level, rural-urban areas and in the regions of Chiapas, Distrito Federal, Guanajuato, Estado de Mexico and Yucatan. The PSUs were established using groups of dwellings, whose size depended on the area (urban or rural). In the first stage of stratification, four stratum were created that grouped all PSUs of the country, this stratification considered sociodemographic characteristics of the members of households and characteristics of dwellings. In the second stratification stage, PSUs were assigned to a geographic stratum and for the last stage, inside each area and stratum; a new stratification process was implemented for some PSUs. As in the previous year the data was collected between August and November (INEGI, 2010). The total sample was 107,781 individuals divided in 27,655 households.

8.5.3. 2012

SAMPLING FRAME

The sampling framework of ENIGH for 2012 followed a similar design to that of previous years (probabilistic three stages, stratified, clustered sampling). PSUs were defined according to dwelling characteristics that varied between rural and urban areas. As in previous years the stratification process considered sociodemographic characteristics of individuals and was conducted in three stages. The sample size was defined using as a reference variable the average level of household income. The information was collected between August and November. The sample is representative at the national level and for both rural and urban areas (INEGI, 2012).

10. DESCRIPTIVE STATISTICS

According to the information included in this study, people with disabilities in LA are characterised by low levels of education, low participation in the labour market and low levels of social participation. Indeed, in all countries levels of unemployment are higher for people with any type of impairment compared to non-disabled individuals. In addition, a higher percentage of people with impairments do not have any type of education and in general, their average education levels are lower than for people without impairments. People with disabilities tend to be older than non-disabled individuals, with an average age 10 to 20 years older than non-disabled individuals. People with physical or mobility impairments are older than people with other types of impairments. The appendices of each country present the individual characteristics of people with disabilities for each year and surveys.

Table 7.5 presents the main descriptive statistics per country and year of the variables included in the econometric model. These statistics are not fully comparable, because they were collected in different years and in some cases using different questions.

TABLE 7. 5. DESCRIPTIVE STATISTICS SURVEY 5 COUNTRIES

Variable	Brazil	Chile			Colombia			Costa Rica	Mexico		
Year	**2008**	**2006**	**2009**	**2011**	**2008**	**2010**	**2011**	**2000**	**2008**	**2010**	**2012**
Final sample size	390,898	268,873	241,300	200,160	50,419	53,453	90,869	378,233	116,798	105,568	33,641
Average age	31	33	34.3	34.5	29	29.8	30	27.4	29.3	29.8	30.2
Female	51.3%	51.2%	51.7%	52.3%	51%	51%	51%	50%	51.5%	51.2%	51.2%
% Population no education	21.4%	2.7%	2.7%	6.6%	5.6%	5.3%	5%	6.4%	8.2	8.1%	6.7%
Average size household	4.0	4.5	4.4	4.2	4.7	4.6	4.7	4.9	5.0	5.0	4.8
% individuals living in households with members with disability	7.3%	21%	23.8%	18.1%	9.2%	14%	9.7%	18.2%	9.5%	17%	19.7%
% Urban	84%	87%	86.9%	87.2%	76%	76.5%	76.7%	59%	76.8%	76.8%	77%
Average age head household	46.4	50.2	51.2	51	47	48	47	44.3	47.6	47.6	47.8
Female head household	32%	26.2%	29.5%	35.3%	27%	30.5%	30	19.7%	21.05%	20.3%	21.4%
Medium level education head household	Primary	Media	Media	Media	Primary	Primary	Primary	Primary	Primary	Primary	Secondary incomplete
% Working head household	71.6%	74.2%	70.4%	70.4%	71.2%	71.6%	74.3%	70.2%	78.6%	77.6%	81.2%
% households with head household with disability	ADL 1.8% Mobility: 1.4%	9.5%	10.5%	7.6%	N/A	7.5%	N/A	7.5%	N/A	8.1%	11%
% Own dwelling	76%	67.5%	68.6%	47%	47.5%	50.8%	51%%	73%	74.55	75%	70.1%
% Rent dwelling	15%	14.9%	16.2%	36%	29%	31.7%	29.6%	15%	12.4%	11.7%	13.3%
% Other dwelling	8.9%	17.6%	15.1%	17%	26.5%	17.4	19.7%	12%	14%	13.3%	15.9%
Food insecurity	N/A	N/A	N/A	N/A	17.2%	6.9%	6.7%	N/A	15.5%	17.8%	18%
% households with school age children not attending school	1.9%	4.4%	3.4%	2.7%	N/A	N/A	N/A	11%	15.1%	13.2%	11.5%

CHAPTER 8

RESULTS CROSS-SECTIONAL ANALYSIS

1. INTRODUCTION

This chapter presents the results of the econometric analysis in each country and year. Different econometric models were estimated in each country, depending on the available data. In Brazil and Chile two econometric models were estimated using different dependent variables. In Colombia, Costa Rica and Mexico only one model was estimated. After the estimation of each model different 'goodness of fit' tests were conducted and the model with the highest explanatory power was selected and is presented in this chapter.

As was explained in chapter 7, depending on the type of dependent variable OLS, binary logits, ordinal logits or generalized ordinal logits were the estimation methods. Each section that follows explains; if it is the case, the type of transformation of the dependent variable, the main goodness of fit tests conducted and the results of the best model.

2. BRAZIL

Two econometric models were estimated in Brazil. The first model included as dependent variable the natural logarithm of household income and the second a variable created with the official classification of minimum monthly wage. In Brazil, the questions on disability were asked to individuals older than 14 years old. In addition, only information related to ADL and mobility impairments was collected, aspects that limit the analysis (see Appendix 2 for details).

2.1. BRAZIL 2008: MODEL 1

The logarithm of household income was used as the dependent variable and different groups of independent variables were included using a specific to general approach (or bottom-up approach) (Magnus, 1999).Different models were estimated in order to analyse how the presence of at least one member with disability in a household affected the levels of household income. Additionally, models including the variables head of household with ADL and mobility impairments were also estimated. Table 8.1 presents the most relevant models; detailed results are presented in the appendix of the country (see Table A2.18 and A2.19 Appendix 2 (Brazil)).

TABLE 8. 1. MAIN RESULTS MODELS 1A AND 1B REGRESSIONS BRAZIL 2008 (LOGARITHM HOUSEHOLD INCOME).

VARIABLES	(1) Model A	(2) Model B
Disability household	**-0.0348*** **	
	(0.00539)	
Head of the household with ADL severe moderate		**-0.132*** **
		(0.00833)
Head of the household with mobility severe moderate		**-0.121*** **
Working with salary	0.274***	0.274***
	(0.00140)	(0.00140)
Size household	0.0384***	0.0377***
	(0.000982)	(0.000978)
Children household	-0.0612***	-0.0602***
	(0.00149)	(0.00149)
Elderly household	0.190***	0.184***
	(0.00298)	(0.00296)
Rondania	0.137***	0.137***
	(0.0107)	(0.0107)
Avre	0.0110	0.0113
	(0.0120)	(0.0119)
Roraima	-0.0221	-0.0213
	(0.0152)	(0.0151)
Para	0.00782	0.00780
	(0.00774)	(0.00774)
Amapa	0.0681***	0.0707***
	(0.0134)	(0.0134)
Tocantins	-0.0267**	-0.0269**
	(0.0108)	(0.0108)
Maranhao	-0.219***	-0.219***

	(0.0102)	(0.0102)
Piaui	-0.284***	-0.284***
	(0.0117)	(0.0117)
Ceara	-0.269***	-0.269***
	(0.00763)	(0.00763)
Rio Grande	-0.147***	-0.148***
	(0.0102)	(0.0102)
Paraiba	-0.263***	-0.263***
	(0.0100)	(0.01000)
Pernambuco	-0.271***	-0.272***
	(0.00771)	(0.00770)
Alagoas	-0.267***	-0.266***
	(0.0111)	(0.0111)
Sergipe	-0.266***	-0.266***
	(0.0106)	(0.0106)
Bahia	-0.238***	-0.238***
	(0.00743)	(0.00743)
Minas Gerais	-0.0494***	-0.0495***
	(0.00733)	(0.00732)
Espirito Santo	-0.0342***	-0.0341***
	(0.0100)	(0.0100)
Rio Janeiro	-0.00740	-0.00772
	(0.00768)	(0.00768)
Sao Paulo	0.0643***	0.0644***
	(0.00722)	(0.00722)
Parana	0.0781***	0.0780***
	(0.00800)	(0.00799)
Santa Catarina	0.177***	0.177***
	(0.00914)	(0.00913)
Rio Grande	0.0875***	0.0874***
	(0.00758)	(0.00758)
Mato Grosso Sur	0.129***	0.129***
	(0.00949)	(0.00948)
Mato Grosso	0.169***	0.170***
	(0.00995)	(0.00995)
Goias	0.0913***	0.0908***
	(0.00811)	(0.00811)
Distrito Federal	0.254***	0.254***
	(0.00969)	(0.00968)
Urban	0.166***	0.167***
	(0.00338)	(0.00338)
Female head of the household	-0.144***	-0.144***
	(0.00237)	(0.00236)
Age head of the household	0.0176***	0.0170***
	(0.000450)	(0.000450)
Age squared head of the household	-6.38e-05***	-5.54e-05***
	(4.66e-06)	(4.67e-06)
Working head of the household	-0.0283***	-0.0321***
	(0.00328)	(0.00329)
Education head household: Fundamental incomplete	0.171***	0.170***
	(0.00312)	(0.00312)
Education head household: Fundamental complete	0.345***	0.344***
	(0.00435)	(0.00435)
Education head household: Media incomplete	0.406***	0.405***
	(0.00571)	(0.00571)

Education head household: Media complete	0.613***	0.612***
	(0.00398)	(0.00398)
Education head household: High education incomplete	1.024***	1.022***
	(0.00778)	(0.00778)
Education head household: High education complete	1.388***	1.387***
	(0.00573)	(0.00573)
Indigenous head of the household	-0.155***	-0.156***
	(0.0175)	(0.0175)
Black head of the household	-0.163***	-0.164***
	(0.00370)	(0.00370)
Asian head of the household	-0.0550***	-0.0556***
	(0.0165)	(0.0165)
Mixed race head of the household	-0.127***	-0.127***
	(0.00241)	(0.00241)
		(0.00900)
Own dwelling	0.181***	0.181***
	(0.0157)	(0.0157)
Rented dwelling	0.206***	0.205***
	(0.0159)	(0.0159)
Borrow dwelling	0.0847***	0.0849***
	(0.0160)	(0.0160)
Poorest 40%	-0.409***	-0.410***
	(0.00265)	(0.00263)
Disability*Poorest40%	0.104***	0.129***
	(0.00766)	(0.00652)
No school attendance	-0.0804***	-0.0811***
	(0.00734)	(0.00734)
Child work	-0.258***	-0.256***
	(0.0188)	(0.0188)
Constant	5.510***	5.527***
	(0.0206)	(0.0207)
Observations	375,603	375,603
R-squared	0.554	0.554

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

According to the information criteria, the best model was the one including the variables type of impairment of head of household (model B). In both models, the basic assumptions of OLS models were tested, cluster robust errors were calculated in order to correct for heteroscedasticity and correlation. An analysis of multicollinearity was conducted and not statistical evidence that supports its existence was found.

In both models different variables related to disability were included, in the case of model A, the variable was presence of at least one member with disability in a

household. The coefficient associated with that variable had a negative effect on the level of household income, with a reduction of 3%. For model B, a reduction of 13% was found when the household head had a severe to moderate ADL limitation and of 12% for heads with mobility limitations. These findings reflect that the presence of a member with a disability in a household had a negative effect on the final level of household income. In cases where the person with a disability was the head, the negative effect was higher.

A variable that represented the interaction between disability and being in the poorest 40% according to the asset index was included. This variable was included in both models as a proxy of poor households with disabled members. It had a positive effect on the final level of income, with an increase by 10% in model A and by 13% in model B. This positive result can be associated with poor households with disabled members receiving income transferences from social assistance programmes. However, this hypothesis needs to be tested.

Variables related to household composition had the expected sign and were significant at 1% for both models. The number of working individuals had a positive effect on the levels of household income. Indeed, if a household increased the number of working members (working and receiving a salary) by one, the household income increased by 27% (ceteris paribus). Additionally, as was expected an increase in the number of children had a negative effect on the levels of household income (-6%). In the case of Brazil, the existence of elderly members in a household (older than 65) had a positive effect on their final level of income. This can be related to the existence of social assistance pensions for people older than 65 years old. Variables related to specific regions and urban areas had the

expected signs and effects. In fact, regions from the North-East (Maranhao, Piaui, Ceara, Rigo Grande, Paraiba, Pernambuco, Alagoas, Sergipe or Bahia) had a negative effect on the levels of household income, with reductions between 15% to 28% of the household income. This finding is similar to that of other studies (Francisco H.G. Ferreira et al., 2003, Ferrerira Filho and Horridge, 2005, Osorio et al., 2011).

Household head characteristics had the expected effects on the final levels of income of a household. Households with female heads had an income level 14% lower than households with male heads. When the head of household was from a minority ethnic group a negative effect on the level of income was observed. Households with non-white heads had a level of income at least 5% lower than white head households, with the lowest decreases in the cases where the head was indigenous or black. As expected, the level of education of the head of households had a positive and significant effect on the final level of household income.

2.2. BRAZIL 2008: MODEL 2

The survey included the variable income from salary, which divided individuals into eight categories according to the level of income of the household and the official minimum monthly wage (MW) (Table 8.2). In the first instance an ordinal logit model was estimated and the parallel regression assumption was tested, in order to determine if the relationship between each pair of outcomes was the same. Statistical evidence was found to reject the null hypothesis and following the suggestion made by Long and Freese (2001) two different models were estimated. The first one included as dependent variable a transformation of the original variable, reducing the number of categories from eight to three, and as in the

previous model, the parallel regression assumption was tested, the null hypothesis was rejected and finally a generalized ordinal logit model was estimated (see results in Table A2.20 and Table A2.21). The second model estimated was a binary model (logit), which classified individuals into two categories (1=living with less than 1 MW and 0=living with more than 1 MW).

TABLE 8. 2. INCOME CATEGORIES BRAZIL 2008

	Percentage
No income	0.96
Less than 1/4 MW	11.03
Between 1/4 to 1/2 MW	20.3
More than 1/2 to 1 MW	28.77
More than 1 to 2 MW	22.27
Between 2 and 3 MW	7.18
More than 3 to 5 MW	5.24
More than 5 MW	4.25

The independent variable was a dichotomous variable, with value of one, when the person was living with less than one MW and 0 when living with more than one MW. As in the previous case, two models were estimated: 1.Including as independent variable *the existence of at least one member with disability in the household*; 2. Including as independent variable *head of the household with ADL and mobility impairment*s. The results of each model are presented in Table 8.3.

TABLE 8. 3. MARGINAL EFFECTS MODELS 2A AND 2B BRAZIL 2008 (BINARY LOGIT: INCOME CATEGORIES)

VARIABLES	Marginal Effects Model A	Marginal Effects Model B
Disability household	**0.0139*** **	
	(0.00478)	
Head of the household with ADL severe moderate		**0.0555*** **
		(0.00900)
Head of the households with severe or moderate mobility limitations		**0.0417*** **
		(0.0102)
Working with salary	-0.126***	-0.126***
	(0.00186)	(0.00185)
Size household	0.0955***	0.0957***
	(0.00144)	(0.00143)

Children household	0.0251***	0.0248***
	(0.00215)	(0.00214)
Elderly household	-0.0633***	-0.0613***
	(0.00364)	(0.00360)
Rondania	-0.0438***	-0.0444***
	(0.0163)	(0.0163)
Avre	-0.00138	-0.00145
	(0.0192)	(0.0191)
Roraima	0.0262	0.0258
	(0.0243)	(0.0243)
Para	0.0259*	0.0257*
	(0.0145)	(0.0145)
Amapa	0.00944	0.00770
	(0.0272)	(0.0272)
Tocantins	0.0393**	0.0393**
	(0.0181)	(0.0181)
Maranhao	0.121***	0.121***
	(0.0228)	(0.0227)
Piaui	0.114***	0.113***
	(0.0194)	(0.0194)
Ceara	0.138***	0.138***
	(0.0135)	(0.0135)
Rigo Grande	0.0676***	0.0676***
	(0.0165)	(0.0164)
Paraiba	0.138***	0.137***
	(0.0224)	(0.0224)
Pernambuco	0.134***	0.134***
	(0.0140)	(0.0140)
Alagoas	0.131***	0.130***
	(0.0225)	(0.0225)
Sergipe	0.111***	0.111***
	(0.0196)	(0.0196)
Bahia	0.118***	0.118***
	(0.0130)	(0.0130)
Minas Gerais	0.0461***	0.0458***
	(0.0131)	(0.0130)
Espirito Santo	0.0392**	0.0390**
	(0.0166)	(0.0166)
Rio Janeiro	0.0305**	0.0304**
	(0.0136)	(0.0136)
Sao Paulo	-0.0151	-0.0154
	(0.0127)	(0.0127)
Parana	-0.0199	-0.0202
	(0.0138)	(0.0137)
Santa Catarina	-0.0704***	-0.0706***
	(0.0155)	(0.0155)
Rio Grande	-0.0254*	-0.0257*
	(0.0134)	(0.0134)
Mato Grosso Sur	-0.0111	-0.0115
	(0.0152)	(0.0151)
Mato Grosso	-0.0355**	-0.0360**
	(0.0170)	(0.0170)
Goias	0.00131	0.00116
	(0.0133)	(0.0132)
Distrito Federal	-0.0361**	-0.0364**
	(0.0148)	(0.0147)
Urban	-0.0464***	-0.0466***
	(0.00563)	(0.00562)
Female head of the	0.0537***	0.0535***

household		
	(0.00268)	(0.00267)
Age head of the households	-0.00801***	-0.00773***
	(0.000495)	(0.000501)
Age squared head of the household	3.61e-05***	3.26e-05***
	(5.18e-06)	(5.26e-06)
Working head of the household	0.0327***	0.0342***
	(0.00345)	(0.00346)
Education head household: Fundamental incomplete	-0.0861***	-0.0855***
	(0.00418)	(0.00419)
Education head household: Fundamental complete	-0.158***	-0.158***
	(0.00522)	(0.00523)
Education head household: Media incomplete	-0.181***	-0.181***
	(0.00639)	(0.00639)
Education head household: Media complete	-0.259***	-0.258***
	(0.00456)	(0.00457)
Education head household: High education incomplete	-0.412***	-0.411***
	(0.00849)	(0.00849)
Education head household: High education complete	-0.483***	-0.482***
	(0.00691)	(0.00691)
Indigenous head of household	0.0603***	0.0610***
	(0.0182)	(0.0182)
Black head of the household	0.0597***	0.0598***
	(0.00423)	(0.00423)
Asian head of the household	0.0149	0.0155
	(0.0175)	(0.0175)
Mixed race head of the household	0.0475***	0.0477***
	(0.00240)	(0.00240)
Own dwelling	-0.0659***	-0.0655***
	(0.0166)	(0.0166)
Rented dwelling	-0.0773***	-0.0769***
	(0.0168)	(0.0168)
Borrow dwelling	-0.00941	-0.00915
	(0.0175)	(0.0175)
Poorest 40%	0.158***	0.158***
	(0.00322)	(0.00322)
No school attendance	0.0703***	0.0704***
	(0.0145)	(0.0145)
Child work	0.0481	0.0471
	(0.0318)	(0.0317)
Observations	379,285	379,285

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results of this model suggest that the probability of living with less than MW increased when the household had at least one member with disability. This

variable was significant at 1%. As expected, if the number of working members increased, the probability of living with less than 1 MW was lower by 12%. The variable related to number of children increased the probability of living with less than one MW by 2.5% and when the number of elderly members increased by one, the probability of living with less than one MW decreased by 6%. As expected, regions in the North-East of the country had a higher probability of living with less than one MW. On the other hand, living in regions in the South of the country (e.g. Sao Paulo) reduced the probability of living with a less than one MW. Variables related to head of household characteristics had the expected effects. Households with a female head had a higher probability of living with less than one MW (increased by 5.4%). In addition, when the head of the household had a higher level of education, the probability of living with less than one MW decreased.

The results of model B indicated that households with household heads with ADL impairments had a positive and significant probability of living with less than one MW. An increase by 4.2% was obtained in the case of households, whose head had mobility impairment. As expected, the probability of living with less than one MW was reduced when the household owned the dwelling (outright or with a mortgage) or rented it, compared to other types of ownership. Additionally, when the household had school age children not attending school or children working, the probability of living with less than one MW was increased by 7% and by 5%, respectively.

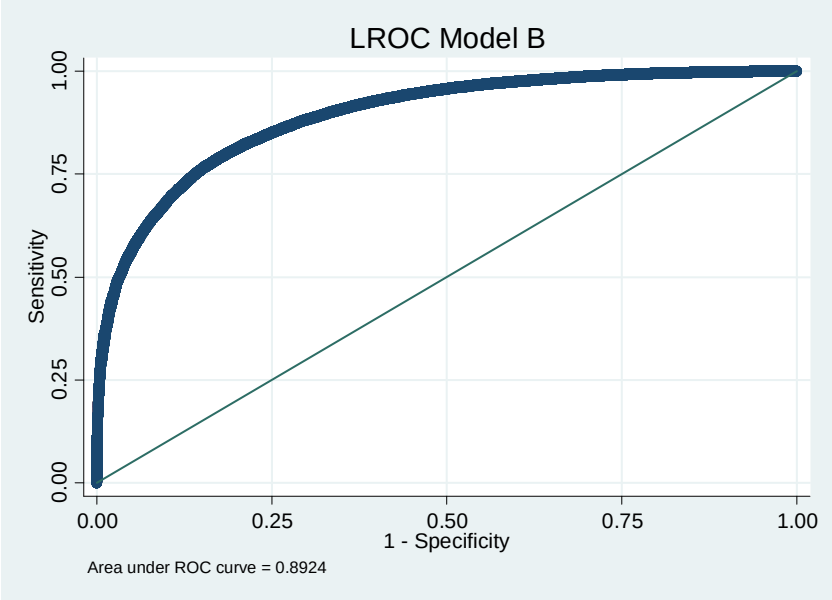
According to the information criteria, the model with the highest explanatory power was model B (Table 8.4). This model classified correctly 80.4% of observations, with a sensitivity of 85% and a specificity of 73%. The receiver

operating characteristics (ROC) curve revealed that the model had a predictive ability of 0.89 (Figure 8.1)

TABLE 8. 4. INFORMATION CRITERIA COMPARING MODELS 2A AND 2B BRAZIL 2008 (INCOME CATEGORIES –BINARY LOGIT)

	Model A	**Model B**	**Difference**
N:	379285	379285	0
Log-Lik Intercept only	-253757.533	-253757.533	0
Log-Lik full model	-151757.423	-151668.938	-88.485
Deviance	303514.847(379232)	303337.877(379231)	176.970(1)
LR	204000.220(52)	204177.189(53)	176.970(1)
Prob>LR	0	0	0
McFadden's r2	0.402	0.402	0
McFadden's Adj R2	0.402	0.402	0
ML (Cox-Snell) R2	0.416	0.416	0
Cragg-Uhler(Nagelkerke) r2	0.564	0.564	0
McKelvey & Zavoina's R2	0.658	0.659	0
Efron's R2	0.457	0.457	0
Variance of y*	9.628	9.639	-0.01
Variance of error	3.29	3.29	0
Count R2	0.811	0.811	0
Adj Count R2	0.517	0.517	-0.001
AIC	0.801	0.8	0
AIC*n	303620.847	303445.877	174.97
BIC	-4.57E+06	-4.57E+06	164.124
BIC'	-203332.225	-203496.349	164.124

FIGURE 8. 1. ROC BRAZIL 2008 MODEL 2B (HEAD HOUSEHOLD TYPE OF IMPAIRMENT) (INCOME CATEGORIES –BINARY LOGIT)



2.3. BRAZIL: CONCLUSION

The results from Brazil showed that the probability of living with less than one MW or having a lower level of income increased when households had disabled members. Additionally, the analysis in this country reflected that households with heads living with mobility or ADL impairment had a higher risk of income poverty than other households, and had a higher probability of living with less than one MW. Although, the analysis was limited by the lack of information on other types of impairments (visual, hearing, mental and learning); the results indicated that disability increases the probability of income poverty and can be understood as facilitator or determinant of poverty.

The characteristics of the head of households, especially level of education had an important and significant role on the levels of income poverty in households, revealing that this continues to be a factor that increases the risk of income poverty.

3. CHILE

3.1. CHILE 2006: MODEL 1

The first model included as the dependent variable the official national measure of poverty. The variable classified individuals into three categories: extra poor; poor and non-poor (Table 8.5). First an ordinal logit was estimated and the assumption of parallel regression was tested, the results provided statistical evidence that the assumption was violated. Therefore, a transformation of the variable was created; reducing the number of categories to two (poor and non-poor) and a binary outcome model (logit) was estimated.

TABLE 8. 5. OFFICIAL CLASSIFICATION OF POVERTY CHILE 2006

Poverty situation	Percentage
Extremely poor	3.18
Poor	10.49
Non- poor	86.33

Two different models were estimated using a specific to general approach, where variables from each group were progressively included. The first model included the variable presence of at least one member with disability in a household. The second included head of household with disability (Table 8.6).

TABLE 8. 6. RESULTS MODEL 1A AND 1B CHILE 2006 (BINARY OUTCOME MODEL: POOR (1) NON-POOR(0))

VARIABLES	Marginal Effects Model A	Marginal Effects Model B
Disability household	**0.0171*** **	
	(0.00348)	
Head of the household with disability		**0.0103** **
		(0.00462)
Working household	-0.0913***	-0.0914***
	(0.00233)	(0.00233)
Elderly household	-0.0365***	-0.0349***
	(0.00417)	(0.00416)
Children household	0.0708***	0.0708***
	(0.00153)	(0.00153)
Urban	0.142***	0.142***
	(0.00355)	(0.00355)
Tarapaca	0.0182	0.0197
	(0.0208)	(0.0208)
Antofogasta	-0.0646***	-0.0638***
	(0.0215)	(0.0215)
Atacama	-0.0580***	-0.0584***
	(0.0212)	(0.0212)
Coquimbo	0.0482**	0.0483**
	(0.0192)	(0.0193)
Valparaiso	0.0252	0.0256
	(0.0187)	(0.0187)
Libertador	0.0154	0.0154
	(0.0187)	(0.0187)
Maule	0.0680***	0.0689***
	(0.0187)	(0.0187)
Bio Bio	0.0658***	0.0667***
	(0.0184)	(0.0184)
Araucania	0.0711***	0.0717***
	(0.0186)	(0.0186)
Los Rios	0.0299	0.0300
	(0.0194)	(0.0194)
Los Lagos	-0.0494***	-0.0491***
	(0.0189)	(0.0189)
Aysen	-0.0583**	-0.0577**
	(0.0229)	(0.0229)
Magallanes	-0.0556**	-0.0552**

	(0.0249)	(0.0249)
Metropolitan Region	-0.00164	-0.000907
	(0.0185)	(0.0185)
High school head of the household	-0.0473***	-0.0475***
	(0.00617)	(0.00617)
Basic Education Head of the household	-0.0187***	-0.0190***
	(0.00635)	(0.00635)
Special education head of the household	-0.124*	-0.124*
	(0.0647)	(0.0648)
Humanistic education head of the household	-0.0801***	-0.0809***
	(0.00667)	(0.00667)
Technical education head of the household	-0.125***	-0.125***
	(0.00810)	(0.00810)
Professional education head of the household	-0.198***	-0.199***
	(0.0134)	(0.0134)
University education head of the household	-0.212***	-0.214***
	(0.0110)	(0.0110)
Graduate education head of the household	-0.264***	-0.266***
	(0.0371)	(0.0371)
Age squared head of the household	-7.91e-05***	-8.07e-05***
	(6.69e-06)	(6.71e-06)
Age head of the household	0.00720***	0.00738***
	(0.000666)	(0.000667)
Female head of the household	0.0126***	0.0128***
	(0.00344)	(0.00345)
Head of the household working	-0.0463***	-0.0467***
	(0.00440)	(0.00442)
Own dwelling	-0.0318***	-0.0317***
	(0.00336)	(0.00336)
Rent dwelling	-0.0149***	-0.0149***
	(0.00492)	(0.00492)
Poorest 40	0.0769***	0.0773***
	(0.00351)	(0.00351)
No school attendance	0.0605***	0.0617***
	(0.00609)	(0.00609)
Observations	263,878	263,878

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For both models, variables related to household composition had the expected signs. According to model 1B, the probability of being classified as poor increases by 1% when the head of the household has any type of impairment. In the case of model A, the coefficient associated with the variable presence of at least one member with disability in the household increased the probability of be classified as poor by 1.7%.

Additionally, an increase in the number of working individuals in a household reduced the probability of being classified as poor by 9%. Moreover, if the number

of elderly members in a household increased by one, the probability of being considered poor decreased by 3.5%. Individuals living in urban areas had a higher probability of being considered poor (+14%). This can be associated with how poverty lines for rural and urban areas were defined, however it is a phenomenon that has also been found in other research (Ministerio de Desarrollo Social, 2011). The signs for each region were the expected for both models.

An increase in the level of education of the head of the household had a negative effect on the probability of being classified as poor. Indeed, when the person was living in a household whose head had a graduate degree the probability of being classified as poor decreased by 26%. Living in a household in the poorest 40% according to the asset index increased the probability of being poor by almost 8%. Households with a female head had a probability 1% higher to be classified as poor, compared to households with a male head.

Both models were compared and model 1A had the highest explanatory power (Table 8.7).

TABLE 8. 7. INFORMATION CRITERIA MODEL 1A AND 1B CHILE 2006 (BINARY OUTCOME MODEL: POOR/NON-POOR)

	Model 1B	**Model 1A**	**Difference**
Log-Lik Intercept only	-113689.367	-113689.367	0
Log-Lik full model	-84526.187	-84476.082	-50.105
Deviance	169052.375(263842)	168952.164(263842)	100.211(0)
LR	58326.359(35)	58426.569(35)	100.211(0)
Prob>LR	0	0	.
McFadden's R2	0.257	0.257	0
McFadden's Adj R2	0.256	0.257	0
ML (Cox-Snell)	0.198	0.199	0
Cragg-Uhler(Nagelkerke) R2	0.343	0.344	-0.001
McKelvey & Zavoina's	0.444	0.445	-0.001
Efron's R2	0.257	0.257	-0.001
Variance of y*	1.799	1.8	-0.002
Variance of error	1	1	0
Count R2	0.869	0.869	0
Adj Count R2	0.152	0.154	-0.002
AIC	0.641	0.641	0
AIC*n	169124.375	169024.164	100.211
BIC	-3.13E+06	-3.13E+06	100.211
BIC'	-57889.445	-57989.656	100.211

The analysis of sensitivity and specificity revealed that the explanatory power of model 1A was around 84% (Figure 8.2). In total 87% of the observations were correctly classified and with a cutoff of 0.2 approximately 75% of both groups were correctly classified (poor and non-poor) (Figure 8.3).

FIGURE 8.2. ROC MODEL 1A (DISABILITY HOUSEHOLD) CHILE 2006 (BINARY OUTCOME MODEL: POOR/NON-POOR)

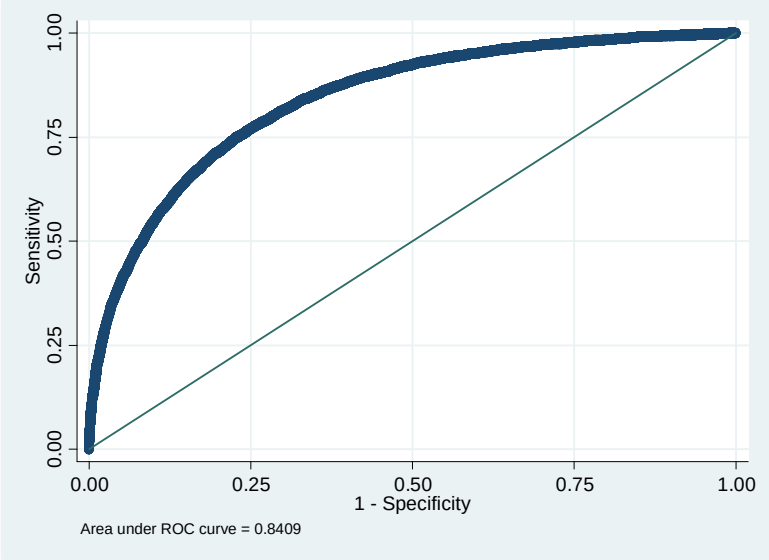
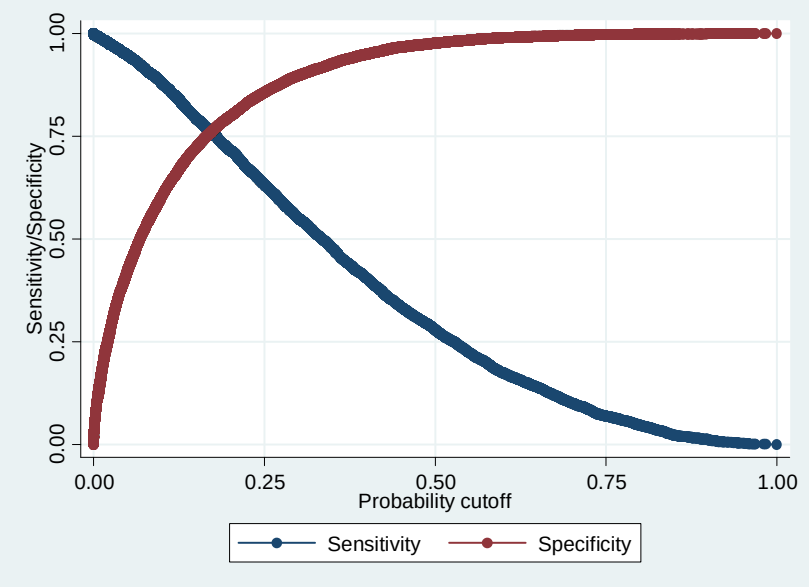


FIGURE 8. 3. SENSITIVITY AND SPECIFY MODEL 1A (DISABILITY HOUSEHOLD) CHILE 2006 (BINARY OUTCOME MODEL: POOR/NON-POOR)



3.2. CHILE 2006: MODEL 2

For this model the dependent variable was a logarithmic transformation of household income. The same groups of independent variables were included, using a specific to general approach. In order to analyse the effect of disability on the household income, two different models were estimated. The first included the

variable *presence of at least one member with a disability* in the household and the second the variable *head of the household with a disability*. Table 8.8 compares the results from both models and tables A3.15 and A3.16 in appendix 3 (Chile) includes the results of all the regressions.

TABLE 8. 8. RESULTS MODEL 2A AND 2B CHILE 2006 (OLS: LOGARITHM HOUSEHOLD INCOME)

VARIABLES	(1) Model 2A	(2) Model 2B
Disability household	**-0.0386*** **	
	(0.00664)	
Head of household with disability		**-0.0709*** **
		(0.00898)
Working household	0.406***	0.405***
	(0.00312)	(0.00312)
Elderly household	0.122***	0.118***
	(0.00649)	(0.00649)
Children household	0.0174***	0.0171***
	(0.00317)	(0.00317)
Urban	-0.0563***	-0.0564***
	(0.00698)	(0.00698)
Tarapaca	0.0204	0.0223
	(0.0343)	(0.0344)
Antofogasta	0.248***	0.250***
	(0.0327)	(0.0327)
Atacama	0.228***	0.229***
	(0.0318)	(0.0318)
Coquimbo	-0.0728**	-0.0716**
	(0.0295)	(0.0296)
Valparaiso	-0.0317	-0.0307
	(0.0281)	(0.0281)
Libertador	-0.0419	-0.0411
	(0.0281)	(0.0281)
Maule	-0.118***	-0.116***
	(0.0284)	(0.0285)
Bio Bio	-0.113***	-0.112***
	(0.0278)	(0.0278)
Araucania	-0.136***	-0.134***
	(0.0284)	(0.0284)
Los Rios	0.00280	0.00393
	(0.0302)	(0.0302)
Los Lagos	0.199***	0.200***
	(0.0284)	(0.0285)
Aysen	0.233***	0.235***
	(0.0354)	(0.0354)
Magallanes	0.275***	0.277***
	(0.0353)	(0.0354)
Metropolitan Region	0.0868***	0.0878***
	(0.0278)	(0.0278)
High school head	0.126***	0.126***
	(0.0110)	(0.0109)
Basic Education Head of the household	0.121***	0.121***
	(0.0118)	(0.0118)

Special education head of the household	0.271**	0.276**
	(0.125)	(0.124)
Humanistic education head of the household	0.377***	0.378***
	(0.0123)	(0.0123)
Technical education head of the household	0.565***	0.565***
	(0.0150)	(0.0150)
Professional education head of the household	0.934***	0.935***
	(0.0231)	(0.0231)
University education head of the household	1.243***	1.244***
	(0.0184)	(0.0184)
Graduate education head of the household	1.742***	1.744***
	(0.0516)	(0.0515)
Age squared head of the household	-9.65e-05***	-9.02e-05***
	(1.11e-05)	(1.11e-05)
Age head of the household	0.0167***	0.0162***
	(0.00117)	(0.00117)
Female head of the household	-0.139***	-0.139***
	(0.00672)	(0.00672)
Head of the household working	0.0996***	0.0958***
	(0.00890)	(0.00894)
Own dwelling	0.0930***	0.0928***
	(0.00672)	(0.00672)
Rent dwelling	0.0898***	0.0899***
	(0.0101)	(0.0101)
Poorest 40	-0.242***	-0.243***
	(0.00697)	(0.00697)
No school attendance	-0.0940***	-0.0969***
	(0.0138)	(0.0138)
Constant	11.14***	11.15***
	(0.0439)	(0.0440)
Observations	262,807	262,807
R-squared	0.474	0.474

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results of Model 2A and 2B suggest that the household income decreased by at least 4% when the household had at least one disabled member. In the case where the person with a disability was the head of the household, a larger reduction (-7.1%) of the household income was observed. Other characteristics of household composition, such as number of elderly individuals and working members increased household income by 12% and 40%, respectively. As in models 1A and 1B, living in urban areas had a negative effect on household income, with a reduction of 5.6%. The effects of the regional variables were those expected, rich

regions such as Magallanes had a significant and positive effect on household income. Variables associated with head of the household characteristics had the expected effects. Indeed, increases in the level of education had a positive and significant effect on household income, with an increase of more than 100%, this is compared to living in a household, whose head does not have any education.

According to the information criteria, each of the models explained a 47.4% of variation of a household income, and there was no statistical evidence that favoured one model over the other. Cluster robust standard errors were calculated and the basic assumptions of OLS models were tested and no statistical evidence was found that these assumptions were violated.

3.3. CHILE 2009: MODEL 1

As in the previous year, the first model estimated used as the dependent variable the official measure of poverty in Chile. The variable classified individuals into three categories according to the minimum income necessary to cover the cost of a basic food basket. In 2010, 3.7% of individuals were classified as extremely poor and 11.3% as poor.

In a first instance an ordinal logistic model was estimated and the assumption of parallel lines was tested using the Brant test (Long and Freese, 2001) . The results provided statistical evidence that this assumption was violated and two approaches were undertaken. First a dichotomous transformation of the dependent variable was conducted and a binary response model was estimated (logit). Second, a generalized ordinal logit was estimated and the probabilities of each alternative were analysed, specifically, the effect of the two variables of interest: presence of at least one member with disability in the household and

head of household with disability. Only the results of the binary response model are presented here, however, the results of the generalized ordinal logit are included in tables A3.32 and A3.33 appendix 3.

After the transformation of the dependent variable, 15.04% of the population was classified as poor. Two different models were estimated, using the transformed variable as dependent. The first included the variable presence of at least one member with disability in the household and the second model included the variable head of household with disability. The independent variables were included using a specific to general approach. Table 8.9 presents the results of both models.

TABLE 8. 9. RESULTS MODEL 1A AND 1B CHILE 2009 (BINARY OUTCOME MODEL: POOR (1) NON-POOR (0))

VARIABLES	Marginal Effects Model 1A	Marginal Effects Model 1B
Disability household	**-0.0151*** **	
	(0.00337)	
Head of the household with disability		**-0.00861** **
		(0.00426)
Elderly household	-0.0676***	-0.0690***
	(0.00368)	(0.00368)
Children household	0.00378*	0.00446**
	(0.00208)	(0.00207)
Working with salary	-0.171***	-0.171***
	(0.00267)	(0.00266)
Size household	0.0574***	0.0568***
	(0.00141)	(0.00141)
Urban	0.145***	0.145***
	(0.00350)	(0.00350)
Tarapaca	-0.0164	-0.0178
	(0.0178)	(0.0178)
Antofagasta	-0.0932***	-0.0936***
	(0.0172)	(0.0171)
Atacama	-0.0282*	-0.0290*
	(0.0167)	(0.0167)
Coquimbo	0.0314**	0.0309**
	(0.0148)	(0.0147)
Valparaiso	-0.00797	-0.00884
	(0.0138)	(0.0138)
Libertador Bernardo	0.0175	0.0166
	(0.0139)	(0.0139)
Maule	0.0608***	0.0599***

	(0.0138)	(0.0138)
Bio Bio	0.0454***	0.0441***
	(0.0135)	(0.0134)
La Araucania	0.0746***	0.0737***
	(0.0137)	(0.0137)
Los Lagos	-0.0297**	-0.0306**
	(0.0143)	(0.0143)
Aysen	-0.00185	-0.00246
	(0.0184)	(0.0184)
Magallanes	-0.0170	-0.0179
	(0.0213)	(0.0212)
Metropolitan Region	-0.000342	-0.00104
	(0.0135)	(0.0135)
Los Rios	0.0219	0.0210
	(0.0146)	(0.0146)
Female head of the household	0.0403***	0.0401***
	(0.00324)	(0.00324)
Age head of the household	0.000519	0.000423
	(0.000608)	(0.000607)
Age squared head of the household	-2.20e-05***	-2.11e-05***
	(5.92e-06)	(5.91e-06)
Basic incomplete head of the household	-0.0210***	-0.0210***
	(0.00564)	(0.00565)
Basic complete head of the household	-0.0427***	-0.0423***
	(0.00612)	(0.00613)
Media humanistic incomplete head of the household	-0.0550***	-0.0545***
	(0.00665)	(0.00665)
Media technical incomplete head of the household	-0.0730***	-0.0726***
	(0.0109)	(0.0109)
Media humanistic complete head of the household	-0.0914***	-0.0907***
	(0.00653)	(0.00653)
Media technical complete head of the household	-0.122***	-0.121***
	(0.00852)	(0.00852)
Technological/university incomplete head of the household	-0.156***	-0.156***
	(0.0121)	(0.0121)
Technological/university complete head of the household	-0.202***	-0.201***
	(0.0100)	(0.0100)
Head of the household working	-0.0124***	-0.0122***
	(0.00415)	(0.00418)
Poorest 40%	0.0522***	0.0518***
	(0.00337)	(0.00337)
Own dwelling	-0.0506***	-0.0506***
	(0.00333)	(0.00333)
Rent dwelling	-0.0217***	-0.0217***
	(0.00474)	(0.00474)
No school attendance	0.0235***	0.0228***
	(0.00717)	(0.00718)
Chile Solidario	0.0351***	0.0348***
	(0.00423)	(0.00423)
Observations	241,300	241,300

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In both models the effect of disability variables did not have the expected results. For both models, the presence of at least one member with disability, no matter their role had a negative effect on the probability of being classified as poor (-1.5% and -0.9%). Different models were estimated in order to determine the association between the variables related to disability and the dependent variable (poor/non-poor). In the models that included only variables related to household characteristics, the variable presence of at least one member with disability in the household had the expected effect (positive). However, when variables associated with head of the household were included, the effect of this variable was reduced. Multicollinearity tests were conducted in order to determine if the unexpected results were a consequence of this, but no statistical evidence to support the existence of it was found.

Variables associated with characteristics of household members had the expected value. Indeed, as the number of children increased the probability of poverty increased by 0.4%. As expected the increases in the number of working individuals and elderly members per household had a negative effect on the probability of being classified as poor. As in 2006, people living in urban areas had higher probability of being poor compared to individuals living in rural areas, results that have also been found by Beccaria et al. (2013) and Ministerio de Desarrollo Social (2011). Regional dummies had the expected signs in both models, with an increase in the probability of being classified as poor in regions such as Araucanía and Bío Bío.

Households with a female head had a probability of poverty higher than households with male heads (+4%). Increases in the level of education of the head

of the household reduced the probability of poverty and all variables associated to education were significant in both models. In cases where the head of the household was working, the probability of poverty had a small decrease (-1.2%). Finally, households receiving a Chile Solidario subsidy had a higher probability of being classified as poor, as expected.

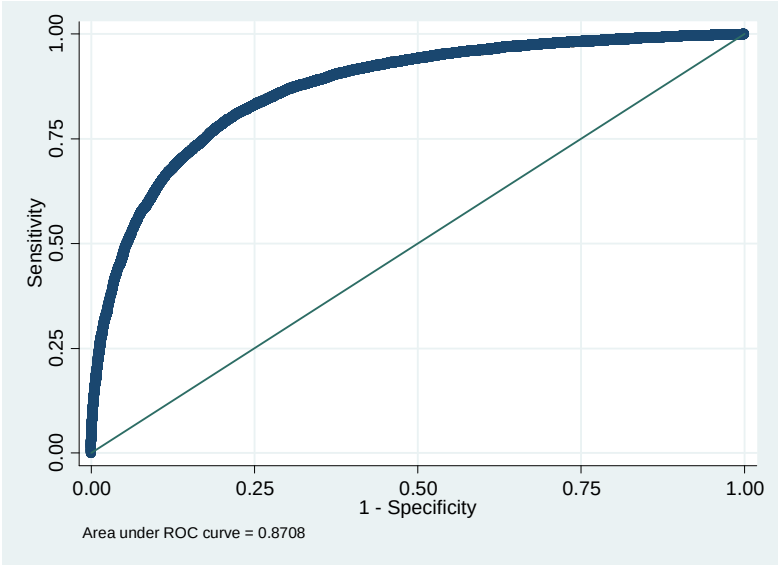
According to the information criteria, the model with the highest explanatory power was model 1A (Table 8.10).

TABLE 8. 10. INFORMATION CRITERIA MODEL 1A AND 1B CHILE 2009 (BINARY OUTCOME MODEL: POOR/NON-POOR)

	Model 1B	**Model 1A**	**Difference**
Log-Lik Intercept only	-108825.506	-108825.506	0
Log-Lik full model	-74031.001	-73991.657	-39.344
Desviance	148062.003(241262)	147983.314(241262)	78.688(0)
LR	69589.009(37)	69667.698(37)	78.688(0)
Prob>LR	0	0	.
McFadden's R2	0.32	0.32	0
McFadden's Adj R2	0.319	0.32	0
ML (Cox-Snell)	0.251	0.251	0
Cragg-Uhler(Nagelkerke) R2	0.422	0.422	0
McKelvey & Zavoina's	0.544	0.545	-0.001
Efron's R2	0.331	0.331	-0.001
Variance of y*	7.221	7.23	-0.009
Variance of error	3.29	3.29	0
Count R2	0.872	0.872	0
Adj Count R2	0.232	0.232	0
AIC	0.614	0.614	0
AIC*n	148138.003	148059.314	78.688
BIC	-2.84E+06	-2.84E+06	78.688
BIC'	-69130.439	-69209.127	78.688

The analysis of sensitivity and specificity of model 1A revealed that 87% of observations were correctly classified; with a high proportion of negative outcomes being classified correctly (97%). The area under the ROC curve was 0.87, suggesting that the model has a good explanatory power of the dependent variable (Figure 8.4).

FIGURE 8. 4. ROC CURVE MODEL 1A (DISABILITY HOUSEHOLD) CHILE 2009 (BINARY OUTCOME MODEL: POOR/NON-POOR)



3.4. CHILE 2009: MODEL 2

The second econometric model included as the dependent variable the natural logarithm of the household income. As in the previous models, different independent variables were included using a specific to general approach. At first, only variables related to household characteristics were included, in order to identify the effect of those variables on the level of income. After, variables related to region and head of household characteristics were also included. Table 8.11 presents the results of the models with the highest goodness of fit measures and better information criteria. Detailed results of all the regressions are included in table A3.34 and A3.35, appendix 3 Chile.

TABLE 8. 11 RESULTS MODEL 2A AND 2B CHILE 2009 (OLS: LOGARITHM HOUSEHOLD INCOME)

VARIABLES	Model 2A	Model 2B
Disability household	**-0.0218*** **	
	(0.00386)	
Head of the household with disability		**-0.0332*** **
		(0.00428)

Elderly household	0.135***	0.132***
	(0.00283)	(0.00284)
Children household	-0.0339***	-0.0330***
	(0.00192)	(0.00192)
Working with salary	0.404***	0.404***
	(0.00173)	(0.00173)
Size household	0.0539***	0.0530***
	(0.00116)	(0.00116)
Urban	-0.0321***	-0.0321***
	(0.00317)	(0.00317)
Tarapaca	-0.0281	-0.0278
	(0.0173)	(0.0173)
Antofagasta	0.222***	0.223***
	(0.0160)	(0.0160)
Atacama	0.0176	0.0180
	(0.0172)	(0.0172)
Coquimbo	-0.138***	-0.138***
	(0.0158)	(0.0158)
Valparaiso	-0.0346**	-0.0345**
	(0.0149)	(0.0149)
Libertador Bernardo	-0.116***	-0.116***
	(0.0150)	(0.0150)
Maule	-0.209***	-0.209***
	(0.0151)	(0.0151)
Bio Bio	-0.150***	-0.150***
	(0.0148)	(0.0148)
La Araucania	-0.240***	-0.239***
	(0.0152)	(0.0152)
Los Lagos	0.0969***	0.0969***
	(0.0152)	(0.0152)
Aysen	0.104***	0.104***
	(0.0193)	(0.0193)
Magallanes	0.182***	0.182***
	(0.0225)	(0.0225)
Metropolitan Region	-0.0214	-0.0213
	(0.0147)	(0.0147)
Los Rios	-0.0797***	-0.0794***
	(0.0159)	(0.0159)
Female head of the household	-0.124***	-0.125***
	(0.00309)	(0.00309)
Age head of the household	0.00468***	0.00450***
	(0.000573)	(0.000572)
Age squared head of the household	9.39e-06*	1.20e-05**
	(5.24e-06)	(5.24e-06)
Basic incomplete head of the household	0.0639***	0.0637***
	(0.00534)	(0.00534)
Basic complete head of the household	0.149***	0.148***
	(0.00587)	(0.00587)
Media humanistic incomplete head of the household	0.215***	0.215***
	(0.00631)	(0.00631)
Media technical incomplete head of the household	0.302***	0.301***
	(0.0106)	(0.0106)
Media humanistic complete head	0.359***	0.359***

of the household		
	(0.00638)	(0.00638)
Media technical complete head	0.448***	0.448***
	(0.00799)	(0.00798)
Technological/university incomplete head of the household	0.728***	0.728***
	(0.0114)	(0.0113)
Technological/university complete head of the household	0.995***	0.995***
	(0.00813)	(0.00812)
Head of the household working	0.161***	0.159***
	(0.00413)	(0.00417)
Poorest 40%	-0.210***	-0.209***
	(0.00356)	(0.00346)
Disability*Poverty	0.0686***	0.0634***
	(0.00552)	(0.00457)
Own dwelling	0.155***	0.155***
	(0.00337)	(0.00337)
Rent dwelling	0.0857***	0.0857***
	(0.00508)	(0.00508)
No school attendance	-0.0765***	-0.0772***
	(0.00664)	(0.00664)
Chile Solidario	-0.0990***	-0.0986***
	(0.00433)	(0.00433)
Constant	11.60***	11.60***
	(0.0223)	(0.0223)
Observations	240,705	240,705
R-squared	0.505	0.505

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results of table 8.11 revealed that contrary to what was found in model 1 (logistic regression), in the cases when logarithm of household income was included as a dependent variable, the presence of at least one member with disability negatively affects the levels of household income. For model 2A, the presence of at least one member with disability reduced the levels of income by 2.2% compared to households without disabled members. In model 2B, when the head of the household had a disability the level of income was reduced by 3.3%. In both models, regional dummies had the expected sign and effect on the levels of income. As expected, people living in the poorest regions of the country (Araucania, Maule and Bio Bio) had lower levels of income compared with people living in Arica and Parinacota (reference variable).

The effects of variables associated with head of the household characteristics were as expected. Indeed, when the household had a female head, the level of income was 12% lower compared to households with male heads. Moreover, the increases in the level of education of head of household had a positive and always significant effect on the levels of income, with an increase of around 100% when the head had completed a university level qualification.

In this model a new dependent variable was included: *disability and poverty* (disability*poverty). This variable was the result of the interaction between the variables *poorest40%* and *disability in the household*. It represented the existence of disabled individuals in the poorest households. This variable was included as a proxy for the existence of households receiving CCTs associated with being poor and having members with disability. In model 2A and 2B, the results were as expected, a positive effect on the final levels of household income with an increase by around 6%. When this variable was included the negative effects of the variables related to disability in both models increased (Tables A3. 34 and A3.35).

Both models had similar information criteria; therefore there was not sufficient statistical evidence to choose one over the other. OLS assumptions were tested and no statistical evidence supported the existence of multicollinearity or violation of the normality assumption. Cluster robust standard errors were estimated in order to correct for heteroscedasticity and correlation between observations.

3.5. CHILE 2011: MODEL 1

As in the two previous years, the official national measure of poverty was used as a dependent variable and a specific to general approach was used to include the

variables. In the first instance, an ordinal logistic model was estimated and the assumption of parallel lines was tested using the Brand test. According to the results, there was statistical evidence that the assumption was violated, and as a consequence the results obtained using an ordinal model will not be correct. The same approaches used in previous years were followed (1. a transformation of the dependent variable and 2. a generalized ordinal logit). Here only the results of the first approach are presented, however the results of the generalized ordinal logit are included in tables A2.52 and A2.53.

The first model estimated was using a dichotomous variable, which classified the population as poor (1) and non-poor (0). In 2011, 14.4% of the population were classified as poor. Two main models were estimated that differ in what variable associated with disability was included. As in the previous year the interaction between disability and poorest 40% was included as independent variable. Model 1A used as explanatory variable *the presence of at least one member with disability* in the household and Model 1B *head of the household with disability.* Table 8.12 presents the main results of both models.

TABLE 8. 12. RESULTS MODEL 1A AND 1B CHILE 2011 (BINARY OUTCOME MODEL: POOR (1) NON-POOR (0))

VARIABLES	Marginal Effects Model 1A	Marginal Effects Model 1B
Disability household		**0.0175*** **
		(0.00535)
Head of the household with disability	**0.0103***	
	(0.00570)	
Children household	0.00684***	0.00719***
	(0.00228)	(0.00229)
Working household	-0.162***	-0.161***
	(0.00276)	(0.00276)
Elderly household	-0.0532***	-0.0547***
	(0.00377)	(0.00377)
Ethnic group household	0.00383***	0.00378***
	(0.00122)	(0.00122)
Size household	0.0521***	0.0517***

	(0.00169)	(0.00169)
Urban	0.143***	0.143***
	(0.00412)	(0.00411)
Tapaca	0.0142	0.0142
	(0.0130)	(0.0130)
Antofagasta	-0.0273**	-0.0271**
	(0.0134)	(0.0135)
Atacama	0.0305**	0.0305**
	(0.0132)	(0.0132)
Coquimbo	0.0831***	0.0834***
	(0.0134)	(0.0134)
Valaparaiso	0.0854***	0.0853***
	(0.0124)	(0.0124)
Libertador	0.0618***	0.0617***
	(0.0128)	(0.0128)
Maule	0.103***	0.103***
	(0.0123)	(0.0123)
Bio Bio	0.101***	0.101***
	(0.0120)	(0.0120)
La Araucania	0.105***	0.105***
	(0.0123)	(0.0123)
Los Lagos	0.0539***	0.0541***
	(0.0126)	(0.0126)
Aysen	0.0183	0.0182
	(0.0135)	(0.0135)
Metropolitan Region	0.0555***	0.0555***
	(0.0121)	(0.0121)
Los Rios	0.0737***	0.0739***
	(0.0124)	(0.0124)
Arica Parinacota	0.0542***	0.0547***
	(0.0134)	(0.0134)
Female head	0.0358***	0.0354***
	(0.00324)	(0.00324)
Age head of the household	-0.000574	-0.000675
	(0.000615)	(0.000613)
Age squared head of the household	-8.20e-06	-6.91e-06
	(6.19e-06)	(6.16e-06)
Primary school head of the household	-0.0279***	-0.0282***
	(0.00798)	(0.00798)
Basic education head of the household	-0.0221***	-0.0225***
	(0.00800)	(0.00799)
Humanities head of the household	-0.0577***	-0.0583***
	(0.00994)	(0.00993)
Media education head of the household	-0.0612***	-0.0611***
	(0.00833)	(0.00831)
Technical education head of the household	-0.0810***	-0.0821***
	(0.0181)	(0.0180)
Technical/ media education head of the household	-0.0838***	-0.0838***
	(0.00934)	(0.00933)
Technical /high education head of the household	-0.143***	-0.143***
	(0.0111)	(0.0111)
Professional head of the household	-0.191***	-0.190***
	(0.0112)	(0.0111)
Postgraduate education head of the household	-0.328***	-0.330***
	(0.0576)	(0.0588)
Working head of the household	0.00438	0.00394
	(0.00425)	(0.00423)
Poorest 40%	0.0690***	0.0714***
	(0.00353)	(0.00363)

Own dwelling	-0.0600***	-0.0599***
	(0.00346)	(0.00346)
Rent dwelling	-0.0274***	-0.0272***
	(0.00453)	(0.00453)
No school attendance	0.0334***	0.0328***
	(0.00891)	(0.00890)
Chile Solidario	0.0287***	0.0285***
	(0.00483)	(0.00483)
Disability*Poverty	-0.0110**	-0.0235***
	(0.00535)	(0.00688)
Observations	200,160	200,160

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The variables associated with disability had in both cases the expected sign, with a positive increase in the probability by 1.7% of being classified as poor when the household has at least one member with disability and by 1% when the household head was disabled. As in the previous year, the variable *disability*poverty* was included in order to control for those households that were poor and had disabled members. This variable as expected had a negative effect on the probability of being classified as poor, reducing it by 2.4% in model 1A and 1.1% in model 1B. One possible explanation of this effect could be the existence of CCTs for households that are poor and had members with disability. However, more research should be conducted on this topic in order to reach a conclusion.

The results revealed that characteristics associated with household composition, such as number of working or elderly members reduced the probability of being classified as poor by 16% and 5%, respectively. As in previous years, living in urban areas increased the probability of poverty by 14%. Compared to the region Magallanes, all other regions had a positive effect on the increase in the probability of being classified as poor in Chile 2011. However, in the poorest regions (Araucania, Maule and Bio Bio) the probability was higher than in Aysen or

Taparaca. Magallanes was considered the region with the lowest level of poverty in 2011 (Ministerio de Desarrollo Social, 2011).

Characteristics of head of household had the expected sign and effect on the probability of being classified as poor. In the case of level of education, households whose head had graduated from education with degrees had a probability 33% lower compared to households whose head had no education. Households with female heads had 3% more probability of being classified as poor compared to households with male heads.

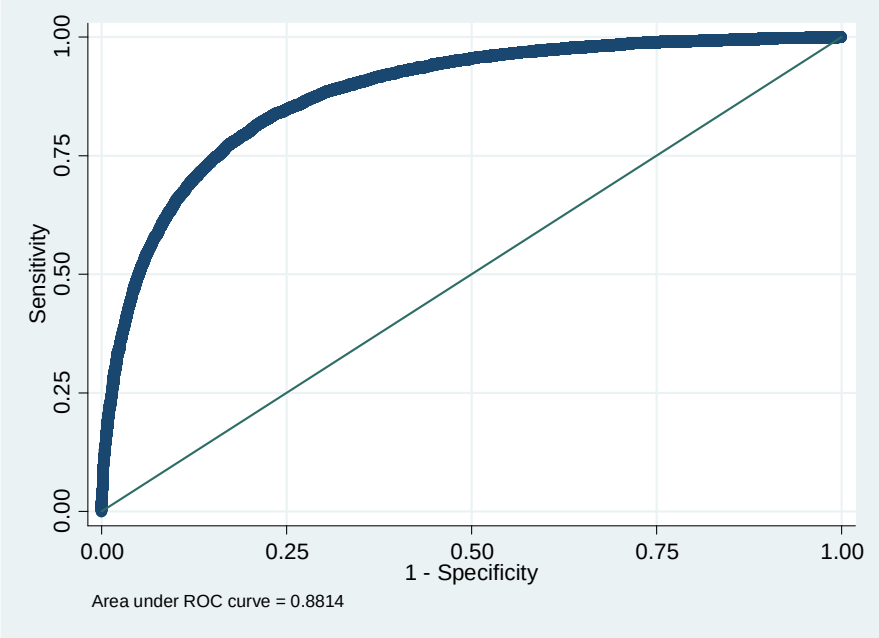
Comparing information criteria from both models, model 1B had the highest explanatory power and best information criteria (Table 8.13).

TABLE 8. 13. INFORMATION CRITERIA MODEL 1A AND 1B CHILE 2011 (BINARY OUTCOME MODEL: POOR/ NON-POOR)

	Model 1B	**Model 1A**	**Difference**
Log-Lik Intercept only	-84055.861	-84055.861	0
Log-Lik full model	-55831.272	-55849.637	18.365
Desviance	111662.543(200119)	111699.274(200119)	36.731(0)
LR	56449.179(40)	56412.448(40)	36.731(0)
McFadden's R2	0.336	0.336	0
McFadden's Adj R2	0.335	0.335	0
ML (Cox-Snell)	0.246	0.246	0
Cragg-Uhler(Nagelkerke) R2	0.432	0.432	0
McKelvey & Zavoina's	0.573	0.573	0
Efron's R2	0.332	0.332	0
Variance of y*	7.706	7.703	0.003
Variance of error	3.29	3.29	0
Count R2	0.883	0.883	0
Adj Count R2	0.214	0.212	0.002
AIC	0.558	0.558	0
AIC*n	111744.543	111781.274	-36.731
BIC	-2.33E+06	-2.33E+06	-36.731
BIC'	-55960.904	-55924.173	-36.731
Log-Lik Intercept only	112163.025	112199.756	-36.731
Log-Lik full model	111744.543	111781.274	-36.731

The analysis of sensitivity and specificity reveal that 88.3% of the observations were correctly classified. The area below the ROC curve was 0.88, an aspect that revealed that the model had a good explanatory power (Figure 8.6).

FIGURE 8. 5. ROC CURVE MODEL 1B (DISABILITY HOUSEHOLD) CHILE 2011 (BINARY OUTCOME MODEL: POOR/ NON-POOR)



3.6. CHILE 2011: MODEL 2

This model included as dependent variable the natural logarithm of household income. As in previous years a logarithmic transformation of housed income was implemented in order to improve the distribution characteristics of the variable. The same groups of independent variables were included, using a specific to general approach.

All the models were corrected for heteroscedasticity and correlation between observations. Problems of multicollinearity between urban and the poorest 40% according to the asset index were found. Using the criteria to analyse how harmful multicollinearity is in the model (Farrar and Glauber, 1967, Gujarati, 2003), it was established that the R^2 of the regression of urban against poorest 40% was lower than the coefficient of correlation between these two variables, and that the only effect was a change of the sign of the variable urban (the significant levels of the

variables did not change between regressions and there were no high levels of R^2 with a few significant variables). Therefore, it was decided to keep the variables and avoid problems of misspecification.

Two different models were estimated using the logarithm of household income as dependent variable. Model 2A included *the presence of at least one member with disability in the household* and model 2B was *head of household with disability*. Table 8.14 presents the two models with the best information criteria, detailed results are included in tables A3.54 and A3.55, Appendix 3.

TABLE 8. 14. RESULTS MODELS 2A AND 2B CHILE 2011 (OLS: LOGARITHM HOUSEHOLD INCOME)

VARIABLES	Model 2A	Model 2B
Disability household	**-0.0792*** **	
	(0.00930)	
Disability head of the household		**-0.0770*** **
		(0.0103)
Working household	0.395***	0.397***
	(0.00403)	(0.00402)
Elderly household	0.122***	0.114***
	(0.00634)	(0.00632)
Children household	-0.0239***	-0.0218***
	(0.00462)	(0.00462)
Ethnic group household	-0.0206***	-0.0208***
	(0.00236)	(0.00236)
Size household	0.0436***	0.0415***
	(0.00287)	(0.00286)
Urban	-0.116***	-0.116***
	(0.00787)	(0.00787)
Tapaca	-0.0868***	-0.0877***
	(0.0197)	(0.0197)
Antofagasta	0.0608***	0.0608***
	(0.0197)	(0.0197)
Atacama	-0.106***	-0.106***
	(0.0206)	(0.0206)
Coquimbo	-0.314***	-0.314***
	(0.0211)	(0.0211)
Valaparaiso	-0.308***	-0.310***
	(0.0196)	(0.0196)
Libertador	-0.267***	-0.268***
	(0.0198)	(0.0198)
Maule	-0.361***	-0.361***
	(0.0194)	(0.0194)
Bio Bio	-0.336***	-0.336***
	(0.0192)	(0.0192)
La Araucania	-0.327***	-0.326***

	(0.0203)	(0.0203)
Los Lagos	-0.168***	-0.168***
	(0.0197)	(0.0198)
Aysen	0.00853	0.00796
	(0.0211)	(0.0211)
Metropolitan Region	-0.163***	-0.164***
	(0.0186)	(0.0186)
Los Rios	-0.237***	-0.236***
	(0.0195)	(0.0195)
Arica Parinacota	-0.200***	-0.199***
	(0.0212)	(0.0212)
Female head of the household	-0.135***	-0.137***
	(0.00604)	(0.00604)
Age head of the household	0.0108***	0.0101***
	(0.00117)	(0.00118)
Age squared head of the household	-7.11e-05***	-6.28e-05***
	(1.14e-05)	(1.14e-05)
Primary school head of the household	0.0964***	0.0943***
	(0.0141)	(0.0141)
Basic education head of the household	0.0900***	0.0868***
	(0.0148)	(0.0148)
Humanities head of the household	0.294***	0.289***
	(0.0173)	(0.0173)
Media education head of the household	0.265***	0.263***
	(0.0154)	(0.0154)
Technical education head of the household	0.438***	0.433***
	(0.0286)	(0.0287)
Technical/ media education head of the household	0.375***	0.373***
	(0.0175)	(0.0175)
Technical /high education head of the household	0.679***	0.679***
	(0.0194)	(0.0194)
Professional head of the household	1.055***	1.055***
	(0.0182)	(0.0182)
Postgraduate education head of the household	1.605***	1.605***
	(0.0472)	(0.0473)
Working head of the household	0.0789***	0.0748***
	(0.00857)	(0.00862)
Poorest 40%	-0.288***	-0.281***
	(0.00730)	(0.00715)
Own dwelling	0.218***	0.219***
	(0.00741)	(0.00741)
Rent dwelling	0.123***	0.124***
	(0.00984)	(0.00984)
No school attendance	-0.0924***	-0.0950***
	(0.0174)	(0.0174)
Chile Solidario	-0.0998***	-0.101***
	(0.0104)	(0.0104)
Disability*Poverty	0.0847***	0.0421***
	(0.0129)	(0.0106)
Constant	12.02***	12.04***
	(0.0382)	(0.0382)
Observations	199,855	199,855
R-squared	0.542	0.541

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Variables that captured the effect of disability had the expected sign and similar magnitudes in both models. Indeed, there was a negative and significant effect of those variables on the final levels of income of the household (-7.7%). As in the previous years, the variable bringing together disability and poverty was also included, aiming to control for the effects that poor households with disabled members had on the levels of income. This variable could be associated with receiving a CCTs, which is conditional on being poor and disabled. In both models, the coefficients were significant and positive, meaning that people living in households classified as poor (according to the asset index) and with disabled members, may have an extra income.

Similar results were obtained in both models. As expected the increase in one child had a negative effect on the levels of household income. The increase in the number of working individuals had a positive and significant effect on the levels of household income, increasing it by almost 40%. If the number of members from other ethnic origins (non-white) increased, the final levels of income decreased by 2%. In this case, size of the household had a positive effect on the levels of household income, aspects that can be associated with economies of scale inside the households (Peter Lanjouw and Ravallion, 1995).

Regional dummies had the expected results. Indeed, people living in the poorest regions of the country (Maule, Bio Bio and Araucania) had a lower level of income and in some cases the reduction was around 35%. As in the previous two years, the levels of income in Chile are lower for people living in urban areas, suggesting the existence of a phenomenon of urban poverty in the country.

Head of the household characteristics played an important role in the levels of household income. As in previous years, an increase in the level of education of the head of household had a positive and significant effect on the levels of household income. A level of education equal or higher than a graduate degree of the head of the household increased the levels of household income by more than 100%. Finally, households with female heads had lower levels of income compared to households with male heads (-14%).

Using the information criteria, it was not possible to choose the best model, given that both had similar AIC, BIC and R^2. Basic assumptions of OLS models were tested, and no statistical evidence was found to reject the null hypothesis of each test.

3.7. CHILE: CONCLUSION

In Chile, the effect of variables related to disability had a different effect on the levels of poverty of Chilean households. Two different types of dependent variables were used in order to analyse the relationship between disability and poverty. When the national measure of poverty was used as dependent variable in 2009, the results were not those expected. Indeed, there was a reduction of the probability of being classified as poor when the household had a member with disability or when the head of household was disabled. In model 2, when natural logarithm of household income was included, the results were the expected. Indeed in the three years the presence of at least one member with disability or a head with disability had a negative effect on the levels of household income with an average reduction of 4% in 2006; 2% in 2009 and 7% in 2011.

Aiming to identify the main reasons of the unexpected result of model 1 in 2009, variables were included in a different sequence, and it was found that the sign of the coefficient was affected by the inclusion of the variable number of working age members in a household and working head of the household. Indeed, when these variables were not included the coefficient associated with disability was positive and significant, nevertheless the explanatory power of model decreased. Additional when the generalized ordinal logit was estimated (table A3.32 and A3.33), the variable head of household with disability had a positive effect on being poor but not extremely poor, aspect that reveals that households with heads with disability had a higher probability of being poor but not extremely poor. As mentioned before, the use of indirect measures of poverty usually do not capture the total effect of disability and ignore the handicap conversion that disabled individuals face.

The variable disability and poverty (*disability*poverty*) was included in 2009 and 2011. The main purpose of this variable was to capture to some extent the existence of an effect that subsidies or CCTs (conditioned on being poor and disabled) can have on the household levels of poverty. In both cases, when the variable was included, a negative effect on the probability of being classified as poor and an increase of the levels of household income were found. It is not possible to conclude that the effect of this variable was only associated with the existence of these type of subsidies.

4. COLOMBIA

In the case of Colombia, questions on disability were asked at the household level in 2008 and 2011 (see appendix 4 (Colombia) for details). Therefore, only for 2010

was it possible to analyse the effect that the variable *head of the household with a disability* had on the probability of subjective poverty. Each of the following sections explains the models and variables estimated for each year in Colombia.

4.1. COLOMBIA 2008

The *subjective perception of poverty* was used as the dependent variable. This question was asked to the head of the household, and aimed to collect information about the perception of poverty of households in Colombia (see appendix 4). For this year, one econometric model was estimated; it included as independent variable *the presence of at least one member with disability in the household*. After the estimation of the models different measures of goodness of fit were calculated and the model with the highest explanatory power was selected. Table 8.15 presents the results of a binary outcome model (logit).

TABLE 8. 15. RESULTS MODEL A COLOMBIA 2008 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR (1), NON-POOR(0))

VARIABLES	Marginal Effects
Disability household	**0.0407****
	(0.0173)
Working household	-0.000369
	(0.00600)
Children household	0.0200***
	(0.00654)
Elderly household	0.0115
	(0.0126)
Size household	-0.0286***
	(0.00527)
Valle	-0.00405
	(0.0155)
Antioquia	-0.0149
	(0.0154)
Amazonas	-0.0256
	(0.0237)
San Andres	0.251***
	(0.0282)
Bogota	-0.0805***
	(0.0192)
Pacific	0.105***
	(0.0156)
Oriental	-0.00562

	(0.0153)
Atlantic	0.106***
	(0.0171)
Urban	-0.0343***
	(0.0128)
Female head of the household	0.00504
	(0.00975)
Primary school head of the household	-0.0542***
	(0.0169)
High school head of the household	-0.124***
	(0.0185)
Technical education head of the household	-0.199***
	(0.0257)
University degree head of the household	-0.257***
	(0.0236)
Age head of the household	9.67e-05
	(0.00184)
Age squared head of the household	-4.11e-07
	(1.90e-05)
Own dwelling	-0.0505***
	(0.0112)
Rent dwelling	-0.000502
	(0.0127)
Food insecurity	0.177***
	(0.0133)
Health care: Subsidised	0.0262***
	(0.00300)
Health Care: No health	0.0333***
	(0.00426)
Poorest 40%	0.116***
	(0.0132)
Social Assistance: Familias en Acción	0.0534***
	(0.0127)
Observations	49,596

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

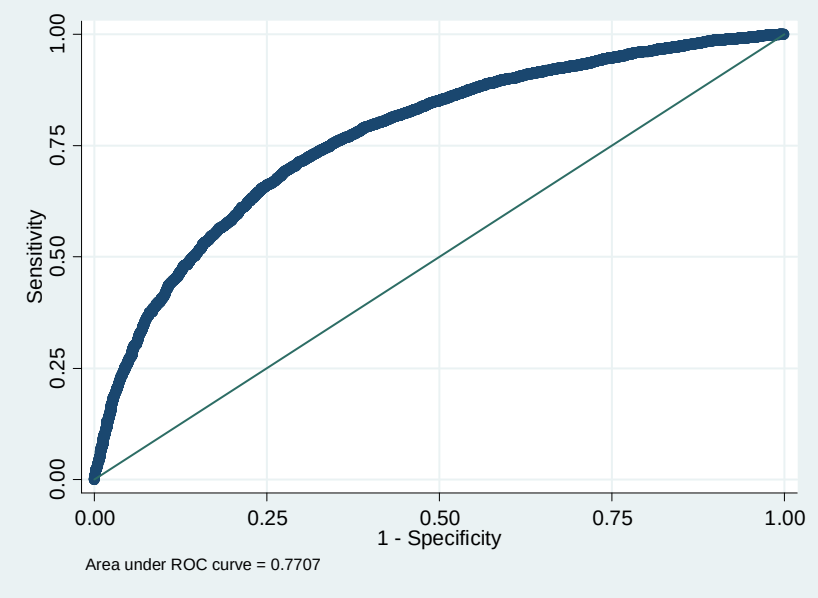
Table 8.16 presents the main results of the different tests of goodness of fit. The overall rate of observations that were correctly classified was 71.53% with a specificity of 60.97% and a sensitivity of 79%. The model has a predictive power and classified most of the observations correctly, the area under the ROC curve was 0.770 (Figure 8.6).

TABLE 8. 16. GOODNESS OF FIT COLOMBIA 2008 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR/NON-POOR))

	Model A
N	49596
Log-Lik Intercept On	-33646.718
Log-Lik Full Model	-27996.668
Deviance	55993.336(49567)

LR	11300.100(28)
McFadden's R2	0.168
McFadden's Adj R2	0.167
ML (Cox-Snell) R2	0.204
Cragg-Uhler(Nagelker R2)	0.274
McKelvey & Zavoina's	0.315
Efron's R2	0.214
Variance of y*	1.46
Variance of error	1
Count R2	0.715
Adj Count R2	0.313
AIC	1.13
AIC*n	56051.336
BIC	-479908.486
BIC'	-10997.373
BIC used by Stata	56306.874
AIC used by Stata	56051.336

FIGURE 8. 6. ROC CURVE MODEL B COLOMBIA 2008 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR/NON-POOR)).



The main results suggested that households with at least one disabled member had a higher probability of considering themselves as poor, compared with households without disabled members. An increase in the number of children increased the probability of subjective poverty by 2%. As expected to live in the richest regions of the country (Bogota and Antioquia) reduced the probability of perception of poverty by 8% and 1.5%, respectively. Finally, individuals who lived in San Andres Island had a probability 25% higher of considering themselves as poor.

Contrary to what was expected, the variable female head of the household did not have a significant effect on the subjective perception of poverty but the sign was the expected. An increase in levels of education of the head of the household had a negative effect on the perception of subjective poverty, with the biggest effect when the head had a level equal or higher than university degree (-26%). As the literature suggests, aspects related to ownership of assets such as dwellings had a direct effect on the individuals' perception of poverty. In fact, households that owned their dwelling had a 5% lower probability of considering themselves poor.

4.2. COLOMBIA 2010

As in the previous year, the variable *subjective perception of poverty* was used as the dependent variable and a binary outcome model was estimated. A specific to general approach of the inclusion of independent variables was also implemented. In this year, disability questions were asked at the individual level, allowing the inclusion of the variable *head of the household with disability*. Two models were estimated, whose main difference was related to the inclusion of the variable *head of the household with disability* and *presence of at least one member with disability in the household*. Table 8.17 presents the marginal effects after the estimation of the binary outcome models, using as dependent variable the subjective perception of poverty.

TABLE 8. 17. MARGINAL EFFECTS MODELS A AND B COLOMBIA 2010 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR (1), NON-POOR (0))

VARIABLES	Marginal Effects Model A	Marginal Effects Model B
Disability household	**0.0513*** **	
	(0.0137)	
Head of the household with disability		**0.0563*** **
		(0.0162)

Children household	0.0115*	0.00980
	(0.00657)	(0.00655)
Elderly household	0.00420	0.0106
	(0.0119)	(0.0118)
Working with salary	-0.0195***	-0.0210***
	(0.00651)	(0.00651)
Size household	-0.0162***	-0.0144***
	(0.00511)	(0.00509)
Atlantic	0.0486***	0.0492***
	(0.0167)	(0.0167)
Oriental	-0.127***	-0.127***
	(0.0162)	(0.0161)
Pacific	0.0826***	0.0818***
	(0.0162)	(0.0162)
Bogota	-0.0569***	-0.0571***
	(0.0194)	(0.0195)
Antioquia	-0.0259	-0.0256
	(0.0161)	(0.0161)
Valle	-0.0246	-0.0242
	(0.0158)	(0.0158)
San Andres	0.0930***	0.0909***
	(0.0239)	(0.0239)
Orinoquia and Amazonas	0.0857***	0.0851***
	(0.0237)	(0.0237)
Urban	0.0181	0.0190
	(0.0123)	(0.0123)
Female head of the household	-0.00137	0.000191
	(0.00974)	(0.00974)
Age squared head of the household	-3.10e-05	-3.23e-05*
	(1.89e-05)	(1.89e-05)
Age head of the household	0.00369**	0.00383**
	(0.00184)	(0.00184)
Primary school head of the household	-0.0673***	-0.0670***
	(0.0167)	(0.0167)
High school head of the household	-0.147***	-0.147***
	(0.0186)	(0.0186)
Technical education head of the household	-0.195***	-0.195***
	(0.0250)	(0.0251)
University degree head of the household	-0.261***	-0.262***
	(0.0236)	(0.0236)
Working head of the household	0.00729	0.00707
	(0.0124)	(0.0124)
Own dwelling	-0.0358***	-0.0351***
	(0.0118)	(0.0118)
Rent dwelling	-0.0104	-0.00996
	(0.0132)	(0.0132)
Food insecurity	0.205***	0.206***
	(0.0192)	(0.0192)
Health care: No health	0.0296***	0.0293***
	(0.00494)	(0.00495)
Health care: Subsidised	0.0276***	0.0278***
	(0.00326)	(0.00326)
Health care: Special regimen	0.000461	0.000615
	(0.00882)	(0.00881)
Social assistance: Familias en Acción	0.0443***	0.0441***
	(0.0115)	(0.0115)
Social assistance: old age subsidy	0.0218	0.0244
	(0.0234)	(0.0234)

Poorest 40%	0.140***	0.140***
	(0.0129)	(0.0129)
Observations	52,705	52,705

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For both models the variables related to disability had a positive effect on the probability of subjective poverty. The increase was 5.1% when a household had at least one member with disability and by 5.6% if the head of the household had a disability. As expected, if the number of working members increased, the probability of perceiving themselves as poor increased by at least 19%. Regional dummies had the expected effect on the perception of poverty. Indeed, people living in the richest regions of the country (Antioquia and Bogota) had a lower probability of subjective poverty. The level of education of the head of the household had a negative effect on the perception of poverty, in cases when the person was living in a household, whose head had a university degree or more, the probability of subjective poverty was reduced by 26%. Contrary to expectations, households with female heads had a negative but insignificant probability of being subjectively poor in model A. In 2010, people living in urban areas had a 2% higher probability of considering themselves as poor, an aspect that was not expected. Households receiving monetary transfers from social assistance programmes had a negative probability of subjective poverty (4.4% for *Familias en Accion* and 2% for old age subsidy).

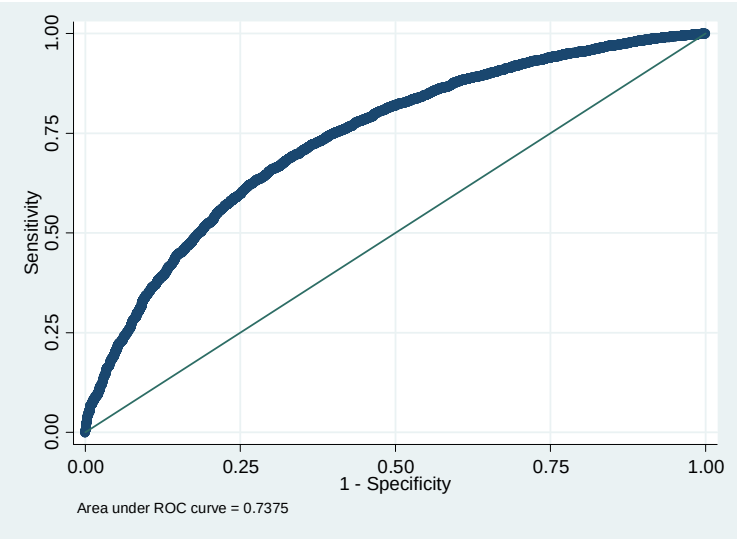
Different goodness of fit tests were conducted in order to define what model had the highest explanatory power. According to the results, strong statistical evidence was found that supported model A (including presence of at least one member with disability). Table 8.18 presents and compares the results of both models.

TABLE 8. 18. GOODNESS OF FIT TEST MODELS A AND B COLOMBIA 2010 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR/NON-POOR))

	Model B	**Model A**	**Difference**
Log-Lik Intercept Only	-36355.324	-36355.324	0
Log-Lik Full Model	-31659.358	-31629.451	-29.907
Deviance	63318.717(52673)	63258.903(52673)	59.814(0)
LR	9391.931(31)	9451.745(31)	-59.814(0)
Prob> LR	0	0	0
McFadden's	0.129	0.13	-0.001
McFadden's Adj. R2	0.128	0.129	-0.001
ML (Cox-Snell) R2	1	1	0
Cragg-Uhler(Nagelkerke) R2	1	1	0
McKelvey & Zavoina's R2	02:00.3	0.251	-0.002
Efron's R2	0.168	0.169	-0.001
Variance of y*	1.333	1.336	-0.003
Variance of error	1	1	0
Count R2	0.681	0.681	0
Adj Count R2	0.305	0.305	0
AIC	1.203	1.201	0.001
AIC*n	63382.717	63322.903	59.814
BIC	-509366.664	-509426.478	59.814
BIC'	-9054.884	-9114.699	59.814

The analysis of sensitivity and specificity of model A revealed that the explanatory power of the model was good, with an area below the ROC curve equal to 0.74 (Figure 8.7). 68.1% of the observations were properly classified, with a sensitivity of 72.7% and a specificity of 62.63%.

FIGURE 8. 7. ROC CURVE MODEL A COLOMBIA 2010 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR/NON-POOR))



4.3. COLOMBIA 2011

As in previous years, the *subjective perception of poverty* was used as the dependent variable. In 2011, as in 2008, disability questions were asked at the household level. This aspect made impossible the analysis of the effect of having a *head of the household with disability* on the perceptions of poverty that Colombian households had in 2011. Nevertheless, a model including the variable presence of at least one member of the household with disability was included. A specific to general approach was used to include the variables. Table 8.19 presents the marginal effects of the model.

TABLE 8. 19. MARGINAL EFFECTS MODEL A COLOMBIA 2011(BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR(1),NON-POOR(0))

VARIABLES	Marginal Effects Model A
Disability household	**0.0603*** **
	(0.0120)
Elderly household	0.0105
	(0.00880)
Children household	0.00856*
	(0.00468)
Size household	-0.0166***
	(0.00367)
Working household	-0.0104**
	(0.00473)
Atlantic	0.0343***
	(0.0130)
Oriental	-0.00364
	(0.0133)
Pacific	0.160***
	(0.0130)
Bogota	-0.101***
	(0.0192)
Antioquia	0.0139
	(0.0157)
Valle Cauca	-0.0240
	(0.0155)
San Andres	0.0967***
	(0.0233)
Orinoquia and Amazonas	-0.0262
	(0.0226)
Urban	-0.0358***
	(0.00888)
Head of the household working	0.00281
	(0.00945)
Female head of the household	0.00240

	(0.00736)
Age head of the household	0.00122
	(0.00134)
Age squared head of the household	-1.08e-05
	(1.38e-05)
Primary school head of the household	-0.0431***
	(0.0119)
High school head of the household	-0.122***
	(0.0133)
Technical education head of the household	-0.192***
	(0.0187)
University degree head of the household	-0.251***
	(0.0173)
Own dwelling	-0.0460***
	(0.00872)
Rent dwelling	-0.00130
	(0.0101)
Food insecurity	0.169***
	(0.0134)
Health care: Special regime	0.00638
	(0.00670)
Health care: Subsidised	0.0223***
	(0.00236)
Health care: No health	0.0247***
	(0.00383)
Social assistance: Familias en Acción	0.0360***
	(0.00839)
Poorest 40%	0.120***
	(0.00935)
Observations	90,869

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The variable that represented the presence of at least one member with disability in the household had a positive and significant effect on the perception of poverty (6%). Variables related to regional dummies had the expected effect on the perception of poverty. Indeed, living in the richest cities reduced the probability of perception of poverty, in the case of Bogota by 10%. As in 2008, people living in rural areas had higher probability of perceiving themselves as poor compared to those living in urban areas (by 3.5%).

As in previous years, people living in households, whose head had a level of education higher or equal to a university degree had a probability 25% lower of perceiving themselves as poor, compared to households whose head had no

education. The ownership of a dwelling had a negative effect on the perception of poverty (-4.6%). Food insecurity and being in the 40% poorest according to the asset index were always significant and had a positive effect on the perception of poverty of a household, increasing it by 17 and 12%, respectively.

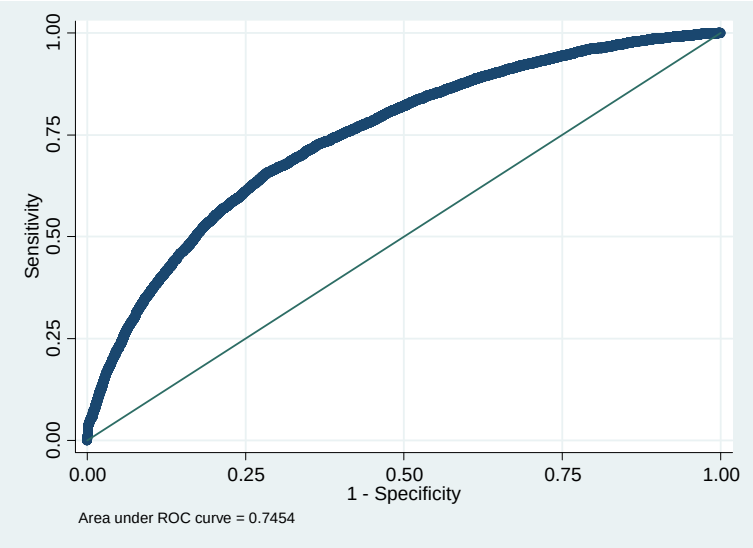
The results of the goodness of fit tests are presented in table 8.20. According to those, the model explains 14% of the perception of poverty of households in Colombia.

TABLE 8. 20. GOODNESS OF FIT MODEL A COLOMBIA 2011 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR/NON-POOR))

Log-Lik Intercept only:	-61959.348	**Log-Lik Full Model:**	-53270.539
Deviance	106541.077(90838)	**LR**	17377.619 (30)
McFadden's R2	0.14	**McFadden's Adj R2:**	0.14
Maximum Likelihood R2	1	**Cragg & Uhler's R2:**	1
McKelvey and Zavoina's R2	0.268	**Efron's R2:**	0.179
Variance of y*:	1.365	**Variance of error:**	1
Count R2:	0.686	**Adj Count R2:**	0.261
AIC:	1.173	**AIC*n:**	106603.077
BIC:	-930572.192	**BIC':**	-17035.104

The analysis of sensitivity and specificity showed that 68.6% of the observations were properly classified by the model. The sensitivity was of 76.42% and a specificity of 58%. The area under the ROC curve was 0.7454, which means that the model had a good explanatory power (Figure 8.8).

FIGURE 8. 8. ROC CURVE MODEL A COLOMBIA 2011 (BINARY OUTCOME MODEL: SUBJECTIVE PERCEPTION OF POVERTY (POOR/NON-POOR))



4.4. COLOMBIA: CONCLUSION

Across the three years, the perception of poverty of households increased when a household had at least one member with disability. This increase was between 4% and 6% and always significant at 1%. In 2010, it was possible to analyse the effect of *head of household with disability* on the perception of poverty; as in the case of households with disabled members, this variable had a significant and positive effect on the perception of poverty. Regional dummies had the expected effects; with a reduction of the probability of considering themselves as poor when they were living in the richest regions of the country. In 2010, individuals living in urban areas had a higher probability of considering themselves as poor; however this variable was not significant in any of the models.

5. COSTA RICA

In the case of Costa Rica, the source of information was the population Census of 2000 and the UBN index was used as the dependent variable. In this country

questions on disability were asked at the individual level, an aspect that allowed the inclusion of variable head of the household with disability in the analysis.

5.1. COSTA RICA 2000: MODEL 1

The index of UBN aims to classify households according to how many basic needs were unsatisfied in a household. Individuals living in households without UBN were considered as non-poor, while one or more basic unsatisfied need of the household (and all its members) were considered as poor (Table 8. 21).

TABLE 8. 21. UNSATISFIED BASIC NEEDS COSTA RICA 2000

UBN	Percentage
No UBN	60.16
One UBN	25.42
Two UBN	9.94
Three UBN	3.57
Four UBN	0.91

An ordinal logistic model was estimated in first instance, the assumption of parallel lines was tested, and statistical evidence revealed that the assumption was violated and ordinal logistic models were not appropriate. One main approach was followed: the number of categories of the dependent variable was reduced to three (1=No UBN; 2= 1 UBN and 3= 2 or more UBN) and a generalized ordinal logit was estimated. As in other countries, independent variables were included using a specific to general approach. Finally, average marginal effects were calculated.

Two models were estimated: 1. model A included the variable presence of a member with disability in the household, and 2. model B included head of household with disability. Table 8.22 presents the marginal effects for model A and table 8.23 for model B.

TABLE 8. 22. MARGINAL EFFECTS MODEL A (DISABILITY HOUSEHOLD) COSTA RICA 2000 (GENERALIZED ORDINAL LOGISTIC MODEL: UBN)

VARIABLES	Marginal Effects Model NO UBN	Marginal Effects Model ONE UBN	Marginal Effects Model TWO OR MORE UBN
Disability household	**-0.0307*** **	**0.0147*** **	**0.0159*** **
	(0.00371)	(0.00179)	(0.00193)
Children household	0.0443***	-0.0311***	-0.0132***
	(0.00198)	(0.00172)	(0.00127)
Elderly household	0.0562***	-0.0270***	-0.0292***
	(0.00461)	(0.00223)	(0.00241)
Working household	0.0625***	-0.0300***	-0.0325***
	(0.00206)	(0.00102)	(0.00109)
Size of the household	-0.0745***	0.0395***	0.0350***
	(0.00136)	(0.00114)	(0.000925)
Urban	0.0245***	-0.0197***	-0.00478*
	(0.00356)	(0.00342)	(0.00259)
Metropolitan Area Region	0.0125**	-0.00598**	-0.00648**
	(0.00582)	(0.00280)	(0.00302)
Rest Central Region	0.0275***	0.0108***	-0.0383***
	(0.00526)	(0.00406)	(0.00328)
Chorotega Region	0.0171**	-0.0187***	0.00162
	(0.00675)	(0.00553)	(0.00399)
Pacific Central Region	-0.00520	0.0150**	-0.00983**
	(0.00754)	(0.00669)	(0.00486)
Atlantic Huetar Region	0.0188***	-0.00901***	-0.00976***
	(0.00600)	(0.00288)	(0.00312)
Northern Huetar Region	0.0258***	-0.0124***	-0.0134***
	(0.00706)	(0.00339)	(0.00367)
Female head of the household	-0.0434***	0.0361***	0.00727**
	(0.00542)	(0.00443)	(0.00359)
Age head of the household	0.00157**	-0.000752**	-0.000815**
	(0.000627)	(0.000301)	(0.000326)
Age square head of the household	-1.24e-05*	5.98e-06*	6.47e-06*
	(6.75e-06)	(3.24e-06)	(3.51e-06)
Primary school head of the household	0.148***	-0.0601***	-0.0879***
	(0.00603)	(0.00532)	(0.00317)
Secondary school head of the household	0.281***	-0.109***	-0.172***
	(0.00672)	(0.00633)	(0.00454)
Secondary/ vocational education head of the household	0.316***	-0.152***	-0.164***
	(0.0116)	(0.00571)	(0.00611)
Technical degree head of the household	0.360***	-0.173***	-0.187***
	(0.0155)	(0.00757)	(0.00816)
University or more degree head of the household	0.382***	-0.120***	-0.262***
	(0.00825)	(0.0128)	(0.0122)

Working head of the household	-0.0452***	0.0217***	0.0235***
	(0.00428)	(0.00207)	(0.00223)
Separate/divorce head of the household	-0.0347***	0.0167***	0.0181***
	(0.00641)	(0.00308)	(0.00333)
Widowed head of the household	-0.00562	0.00270	0.00292
	(0.00784)	(0.00376)	(0.00407)
Single head of the household	-0.0216***	0.000581	0.0211***
	(0.00629)	(0.00573)	(0.00440)
Poorest 40%	-0.244***	0.0540***	0.190***
	(0.00301)	(0.00349)	(0.00318)
Own dwelling	0.0888***	-0.0333***	-0.0555***
	(0.00446)	(0.00417)	(0.00273)
Rent dwelling	0.0785***	-0.0183***	-0.0602***
	(0.00548)	(0.00545)	(0.00395)
Observations	378,233	378,233	378,233

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The variable *presence of at least one member with disability* in the household had the expected sign and effect for each outcome. The variable had a negative effect and the probability of no having UBN was 3% lower, if the household had at least one member with disability. By contrast, the probability of having one UBN increased by 1.5% and having two or more increased by 1.6% for households with at least one member with disability.

The results revealed that an increase in the number of children per household increased the probability of not having UBN by 4.4%. In the case of number of elderly the probability of having two or more UBN decreased by 2.9%, when the number of elderly members increased by one. As expected, the increase in the number of working members in a household increased the probability of not having UBN by 6.2%. These results were found when the model included the variable *size of the household,* when it was not controlled by this the increase in the number of children in a household increased the probability of having one UBN (+1%) or two or more UBN (+2.7%). The signs associated with the variable elderly

in the household did not change with the inclusion of this variable (see table A5.14, appendix 5).

The variable urban had a positive effect for those households with no UBN, increasing the probability by 2.4%. In addition, living in urban areas reduced the probability of have one or more UBN by 1.9% and 0.5%, respectively. The regional dummies increased the probability of living in a household with no UBN in all cases, except in Pacific Central Region.

Variables related to head of household characteristics had the expected signs and marginal effects. Indeed, households with a female head had a higher probability of having one UBN (3.6%). As expected, an increase in the levels of education of the head of household was positively associated with not having any UBN and negatively to have one or more UBN. Indeed, in cases that the individual was living in a household, whose head had a university degree (or more), the probability of no having UBN increased by 38% compared to households whose head did not have an education.

Table 8.23 presents the results of the generalized ordinal logit for UBN, including the variable head of the household with disability.

TABLE 8.23. MARGINAL EFFECTS MODEL B (HEAD HOUSEHOLD WITH DISABILITY) COSTA RICA 2000 (GENERALIZED ORDINAL LOGISTIC MODEL: UBN)

VARIABLES	Marginal Effects Model NO UBN	Marginal Effects Model 1 UBN	Marginal Effects Model 2 or more UBN
Head of the household with disability	**-0.0212*** **	**0.0102*** **	**0.0110*** **
	(0.00513)	(0.00247)	(0.00267)
Children household	0.0452***	-0.0315***	-0.0137***
	(0.00198)	(0.00172)	(0.00127)
Elderly household	0.0529***	-0.0254***	-0.0275***
	(0.00461)	(0.00222)	(0.00240)

Working household	0.0633***	-0.0304***	-0.0329***
	(0.00206)	(0.00102)	(0.00109)
Size household	-0.0757***	0.0401***	0.0356***
	(0.00135)	(0.00114)	(0.000923)
Urban	0.0246***	-0.0198***	-0.00484*
	(0.00356)	(0.00342)	(0.00259)
Metropolitan Area Region	0.0121**	-0.00583**	-0.00631**
	(0.00582)	(0.00280)	(0.00303)
Rest Central Region	0.0272***	0.0109***	-0.0381***
	(0.00526)	(0.00406)	(0.00328)
Chorotega Region	0.0165**	-0.0185***	0.00194
	(0.00676)	(0.00553)	(0.00399)
Pacific Central Region	-0.00566	0.0152**	-0.00954**
	(0.00755)	(0.00669)	(0.00486)
Atlantic Huetar Region	0.0179***	-0.00859***	-0.00930***
	(0.00600)	(0.00288)	(0.00312)
Northern Huetar Region	0.0259***	-0.0124***	-0.0135***
	(0.00707)	(0.00340)	(0.00367)
Female head of the household	-0.0440***	0.0363***	0.00771**
	(0.00543)	(0.00443)	(0.00358)
Age head of the household	0.00136**	-0.000654**	-0.000708**
	(0.000628)	(0.000302)	(0.000326)
Age squared head of the household	-1.06e-05	5.09e-06	5.51e-06
	(6.77e-06)	(3.25e-06)	(3.52e-06)
Primary school head of the household	0.148***	-0.0604***	-0.0880***
	(0.00603)	(0.00532)	(0.00317)
Secondary school head of the household	0.282***	-0.110***	-0.172***
	(0.00672)	(0.00634)	(0.00454)
Secondary/ vocational education head of the household	0.317***	-0.152***	-0.165***
	(0.0116)	(0.00572)	(0.00612)
Technical degree head of the household	0.362***	-0.174***	-0.188***
	(0.0155)	(0.00758)	(0.00818)
University or more degree head of the household	0.383***	-0.121***	-0.262***
	(0.00825)	(0.0128)	(0.0122)
Working head of the household	-0.0454***	0.0218***	0.0236***
	(0.00429)	(0.00207)	(0.00223)
Separate/divorce head of the household	-0.0347***	0.0167***	0.0180***
	(0.00640)	(0.00308)	(0.00333)
Widowed head of the household	-0.00614	0.00295	0.00319
	(0.00783)	(0.00376)	(0.00407)
Single head of the household	-0.0224***	0.00100	0.0214***
	(0.00629)	(0.00573)	(0.00440)
Poorest 40%	-0.245***	0.0545***	0.190***
	(0.00300)	(0.00349)	(0.00318)
Own dwelling	0.0890***	-0.0334***	-0.0556***

	(0.00446)	(0.00417)	(0.00273)
Rent dwelling	0.0789***	-0.0184***	-0.0605***
	(0.00549)	(0.00545)	(0.00395)
Observations	378,233	378,233	378,233

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

When controlling for household size, the variable associated with head with a disability had the expected sign for each of the outcomes. It increased the probability of living with one UBN by 1% and with two or more UBN by 1.1%. Variables related to household characteristics such as number of children, number of elderly members and number of working members increased the probability of not having UBN. Indeed, in each of the cases, there was an increase of at least 4% in the probability of not having any UBN. On the other hand, if the *size of the household* increased by one, the probability of having one UBN increased by 4% and 2 or more UBN increased by 3.6%. In the cases where the variable *size of the household* was not included, the signs of the variables *working members* and *number of children in the household* changed, with a negative effect on the probability of living in a household with no UBN (see table A5.15 appendix 5).

The variable urban had the expected effect, with an increase on the probability of living in a household with no UBN (+2.5%) and decreased the probability of living with one UBN (-2%) and 2 or more UBN (-0.5%). Dummy variables associated with each of the Regions of Costa Rica had the expected effects, except in the cases of Pacific Central Region that in this case had a negative but insignificant effect on living in a household with no UBN.

Variables associated with head of the household characteristics had the expected effects on the probability of being classified in any of the outcomes. Indeed, each of the levels of education of the head of the household had a positive and significant

effect on the probability of living in a household with no UBN. Households with female heads had positive and significant probability of having one UBN (3.6%) or 2 or more (1%), In the case of working head of the household, a negative effect on the probability of living in a household with UBN was found, the sign of this variable changed when the variable size of the household was not included (see Table A5.15 appendix 5).

5.2. COSTA RICA: CONCLUSION

In the case of Costa Rica a transformation of the UBN variable was used as the dependent variable. Two independent variables related to disability were included: *presence of at least one member with disability* and *head of the household with disability*. Two models were estimated and each of them included one of the variables related to disability. In both models the variable related to disability had the expected effects with an increase on the probability of having one or more UBN, with a reduction of the probability of not having UBN by 3% in the first case and by 2.2% in the case that the head of the household had a disability.

Control variables associated with household characteristics had different effects depending on the inclusion of the variable *size of the household*. Changes on the sign of the coefficients of number of children in the household and number of working members in the household changed. These changes are associated with the effect that size of household had on the probability of UBN, given that overcrowding is one dimension included in this index. As in other countries, higher levels of education of the head of the household had a significant effect on the probability of being classified as poor, or in this case of having one or more UBN.

UBN is not an indicator that captures the magnitude of disability or the effect of direct, indirect or opportunity costs of this condition. Nevertheless, the results presented in this analysis revealed that the presence of at least one member with a disability in a household or the fact that the head of the household had a disability were positively associated with having one or more UBN. This means that households with disabled members have a higher probability of being deprived even in basic indicators, such as overcrowded, school attendance and access to water and sanitation.

6. MEXICO

6.1. MEXICO 2008

In the case of Mexico, information on household income was used as the dependent variable. As in previous countries and surveys different independent variables associated with household characteristics, area, region and head of the household were included in the model, using a specific to general approach. Different models were estimated in order to analyse the effect of the presence of at least one member with a disability in the household on income. Table 8.24 presents the results of the model with the best information criteria. There is no inclusion of head of household with disability since questions on disability were asked at the household level and it was not possible to identify the role that the person with disabilities played in the household. Detailed results are presented in table A6.12 in appendix 6 (Mexico).

TABLE 8. 24. RESULTS REGRESSION MODEL A (OLS: LOGARITHM HOUSEHOLD INCOME MEXICO 2008)

VARIABLES	Model A
Disability household	**-0.0233*** **
	(0.00615)
Number elderly household	-0.0220***
	(0.00473)
Number children household	-0.0554***
	(0.00217)
Number working household	0.203***
	(0.00212)
Size household	0.0547***
	(0.00150)
Urban	0.258***
	(0.00478)
Aguas Calientes	0.0881***
	(0.0216)
Baja California	0.297***
	(0.0193)
Baja California Sur	0.470***
	(0.0243)
Campeche	-0.0832***
	(0.0212)
Ciahuila	0.0417**
	(0.0180)
Colima	0.153***
	(0.0210)
Chiapas	-0.409***
	(0.0163)
Chihuahua	0.0455***
	(0.0168)
Distrito Federal	0.145***
	(0.0143)
Durango	-0.0735***
	(0.0190)
Guanajuato	0.0321**
	(0.0144)
Guerrero	-0.277***
	(0.0173)
Hidalgo	-0.115***
	(0.0194)
Jalisco	0.0648***
	(0.0142)
Mexico	0.0126
	(0.0138)
Michiacan	0.00884
	(0.0172)
Morelos	0.0510***
	(0.0179)
Nayarit	-0.104***
	(0.0211)
Nuevo Leon	0.210***
	(0.0206)
Oaxaca	-0.170***
	(0.0166)
Puebla	-0.183***

	(0.0169)
Queretaro	0.121***
	(0.0140)
Quintana Roo	0.0765***
	(0.0215)
Sinaloa	0.0937***
	(0.0198)
Sonora	0.164***
	(0.0142)
Tabasco	0.00610
	(0.0178)
Tamaulipas	0.0277
	(0.0188)
Tlaxcala	-0.0912***
	(0.0190)
Veracruz	-0.0296*
	(0.0169)
Yucatan	-0.000170
	(0.0142)
Zacatecas	-0.0840***
	(0.0211)
Age head of the household	0.00297***
	(0.000860)
Age squared head of the household	2.38e-05***
	(8.78e-06)
Female head of the household	0.0165***
	(0.00591)
Divorce head of the household	0.00492
	(0.0103)
Widower head of the household	0.0159
	(0.0107)
Married head of the household	0.0343***
	(0.00933)
Incomplete primary school head of the household	0.124***
	(0.00670)
Complete primary school head of the household	0.240***
	(0.00711)
Incomplete secondary school head of the household	0.324***
	(0.0101)
Complete secondary school head of the household	0.389***
	(0.00750)
Incomplete high school head of the household	0.466***
	(0.0117)
Complete high school head of the household	0.584***
	(0.00937)
Incomplete undergraduate head of the household	0.796***
	(0.0142)
Complete undergraduate head of	1.133***

the household	
	(0.00977)
Graduate studies head of the household	1.495***
	(0.0180)
Working head of the household	-0.0409***
	(0.00550)
Rent dwelling	-0.0881***
	(0.00674)
Own dwelling	0.0649***
	(0.00502)
Poorest 40	-0.410***
	(0.00429)
Food insecurity	-0.195***
	(0.00496)
No school attendance	-0.0552***
	(0.00497)
Constant	9.057***
	(0.0286)
Observations	116,788
R-squared	0.545

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The variable associated with the *presence of at least one member with a disability in the household* was significant and had a negative effect on the levels of household income (-2.3%). Given that variables were included in different stages, the magnitude of the coefficients changed, with major changes when variables related to characteristics of the head of the household were included. An increase in the number of members older than 65 years reduced the levels of household income by 2%. As expected, an increase in the number of working members, who were earning a salary, had a significant effect on the levels of income, with an increase of 20%. Additionally, the income of people living in urban areas increased by 26% compared to those living in rural areas.

As in other countries and surveys, higher levels of education of the head of the household had a positive effect on the levels of household income. Indeed, an increase of more than 100% was observed when the head of the household had a graduate diploma or more compared to no education. In cases, where the head of

household was married, the levels of income increased by 3.4% compared to the income of single heads of households. The variable *female head of household* had a positive effect on the levels of household income; indeed, households with female heads had an income 1.7% higher than male heads of household. This happened when the model included variables related to marital status of the head of household. Finally, *dwelling ownership, food insecurity, poorest 40%* according to the asset index and *no school attendance* had the expected effects, with a negative effect on household income levels for the last three variables and when the family was living in a rented dwelling compared to living in a household under other conditions.

According to the information criteria, the model explained 54.5% of variation in household income. Cluster robust standard errors were calculated and the basic assumptions of OLS models were tested and no statistical evidence was found that these assumptions were violated.

6.2. MEXICO 2010

The dependent variable was the logarithmic transformation of household income, and independent variables were included using a specific to general approach. In this year, disability questions were asked at the individual level, therefore the variable head of the household with disability was included as explanatory variable. Two different models were estimated, one including *presence of at least one member with disability in the household* and other including the variable *head of the household with disability*. Cluster robust standard errors were calculated for each model in order to correct for heteroscedasticity and correlation between

observations. The main results of both models are presented in table 8.25 and detailed results of all regressions are presented in tables A6.26 and A6.27.

TABLE 8. 25. RESULTS REGRESSION MODELS A AND B LOGARITHM HOUSEHOLD INCOME MEXICO 2010

VARIABLES	Model A	Model A
Disability household		**-0.0400*** **
		(0.00503)
Head of the household with disability	**-0.0735*** **	
	(0.00701)	
Number children household	-0.0434***	-0.0441***
	(0.00217)	(0.00218)
Number elderly household	-0.00128	0.00490
	(0.00483)	(0.00488)
Number working household	0.200***	0.199***
	(0.00212)	(0.00212)
Size Household	0.0512***	0.0519***
	(0.00139)	(0.00140)
Aguas Calientes	0.270***	0.269***
	(0.0184)	(0.0184)
Baja California	0.407***	0.408***
	(0.0182)	(0.0182)
Baja California Sur	0.422***	0.423***
	(0.0214)	(0.0213)
Campeche	0.178***	0.178***
	(0.0196)	(0.0196)
Ciahuila	0.186***	0.186***
	(0.0179)	(0.0179)
Colima	0.342***	0.342***
	(0.0199)	(0.0199)
Chiapas	-0.134***	-0.133***
	(0.0146)	(0.0145)
Chihuahua	0.0648***	0.0642***
	(0.0176)	(0.0176)
Distrito Federal	0.330***	0.331***
	(0.0146)	(0.0146)
Durango	0.0337*	0.0352*
	(0.0184)	(0.0184)
Guanajuato	0.116***	0.115***
	(0.0147)	(0.0147)
Guerrero	-0.115***	-0.116***
	(0.0173)	(0.0173)
Hidalgo	0.0729***	0.0741***
	(0.0182)	(0.0181)
Jalisco	0.281***	0.282***
	(0.0176)	(0.0176)
Mexico	0.204***	0.205***
	(0.0144)	(0.0144)
Michiacan	0.115***	0.116***
	(0.0183)	(0.0183)
Morelos	0.224***	0.224***
	(0.0180)	(0.0180)
Nayarit	0.0708***	0.0714***
	(0.0209)	(0.0209)

Nuevo Leon	0.382***	0.382***
	(0.0184)	(0.0184)
Oaxaca	-0.0413**	-0.0407**
	(0.0165)	(0.0165)
Puebla	0.0484***	0.0489***
	(0.0168)	(0.0168)
Queretaro	0.314***	0.314***
	(0.0181)	(0.0181)
Quintana Roo	0.378***	0.380***
	(0.0201)	(0.0201)
Sinaloa	0.222***	0.223***
	(0.0191)	(0.0191)
Sonora	0.231***	0.232***
	(0.0176)	(0.0176)
Tabasco	0.176***	0.177***
	(0.0179)	(0.0179)
Tamaulipas	0.0647***	0.0671***
	(0.0178)	(0.0178)
Tlaxcala	0.112***	0.113***
	(0.0192)	(0.0192)
Veracruz	0.126***	0.127***
	(0.0169)	(0.0168)
Yucatan	0.0862***	0.0868***
	(0.0146)	(0.0146)
Zacatecas	0.0595***	0.0603***
	(0.0195)	(0.0195)
Urban	0.260***	0.260***
	(0.00499)	(0.00499)
Female head of the household	0.0579***	0.0601***
	(0.00648)	(0.00648)
Age head of the household	0.00435***	0.00526***
	(0.000851)	(0.000849)
Age squared head of the household	4.19e-06	-7.16e-06
	(8.63e-06)	(8.58e-06)
Incomplete primary school head of the household	0.111***	0.112***
	(0.00693)	(0.00693)
Complete primary school head of the household	0.222***	0.223***
	(0.00732)	(0.00732)
Secondary incomplete head of the household	0.270***	0.271***
	(0.0111)	(0.0111)
Secondary complete head of the household	0.379***	0.380***
	(0.00769)	(0.00769)
High school incomplete head of the household	0.409***	0.409***
	(0.0119)	(0.0119)
High school complete head of the household	0.538***	0.538***
	(0.00924)	(0.00924)
Professional incomplete head of the household	0.804***	0.803***
	(0.0155)	(0.0155)
Professional complete head of the household	1.050***	1.050***
	(0.00963)	(0.00962)
Graduated head of the household	1.455***	1.455***
	(0.0160)	(0.0160)
Married head of the household	0.0789***	0.0784***
	(0.0101)	(0.0101)
Divorce head of the household	0.0443***	0.0426***
	(0.0107)	(0.0107)
Widower head of the household	0.0558***	0.0538***
	(0.0110)	(0.0110)
Working head of the household	-0.0925***	-0.0883***

	(0.00572)	(0.00568)
Rent dwelling	-0.110***	-0.110***
	(0.00686)	(0.00686)
Own dwelling	0.0875***	0.0873***
	(0.00504)	(0.00505)
Poorest 40	-0.438***	-0.438***
	(0.00443)	(0.00443)
Food insecurity	-0.187***	-0.187***
	(0.00464)	(0.00465)
No school attendance	-0.0720***	-0.0708***
	(0.00552)	(0.00553)
Constant	8.805***	8.783***
	(0.0274)	(0.0273)
Observations	105,553	105,553
R-squared	0.561	0.561

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Both variables related to disability had the expected effect on the final levels of income. In model A, the variable *head of household with disability* had a negative effect on levels of income, with a reduction by 7.4%. The effect was significant in all models estimated. In model B, the variable *presence of at least one member of the household with a disability* reduced the final levels of household income by 4%.

The effect of number of children and working members of the household was the expected, with a reduction of household income by 4% and an increase by 20%, respectively. Individuals living in urban areas had an income 26% higher than those living in rural areas. Regional dummies had the expected effect on the final levels of household income, with an increase by 33% in the Distrito Federal and of 41% in Baja California Sur. Education of head of the household had the expected effects on the levels of household income, with significant increases of more than 100% on the final levels of household income. The marital status of the head of household had a positive effect on the levels of household income compared to single head households (+7.9%). The effect of the variable female head of household had a positive effect on the levels of income, increasing it by 6%. As in 2008, this change was observed when variables associated with marital status of

head of the household were included. Additionally, as in 2008, the inclusion of both variables: "*number of working members per household*" and "*head of household working*", caused that the effect of the second variable was negative on the final level of income.

The results revealed that if the individual lived in a rented house, the household income was reduced by 11%. Food insecurity and no school attendance also had a negative effect on the final levels of household income, with a reduction of 19% and 7%, respectively.

6.3. MEXICO 2012

The logarithmic transformation of the household income was used as the dependent variable. Using a similar approach to the one implemented for the previous years and countries, different groups of independent variables were included in the models using a specific to general approach. Two general models were estimated: the first included the variable *presence of at least one member with disability in the household* and the second *head of household with disability*. Cluster robust standard errors were calculated for each model in order to correct for heteroscedasticity and correlation between observations. Table 8.26 presents the main results of both models, and detailed results are presented in tables A6.41 and A6.42 (appendix 6).

TABLE 8. 26. RESULTS REGRESSION MODELS A AND B (OLS: LOGARITHM HOUSEHOLD INCOME MEXICO 2012)

VARIABLES	Model 1	Model 2
Disability in the household	**-0.0545*** **	
	(0.00823)	
Head of the household with disability		**-0.0649*** **
		(0.0108)
Number elderly household	0.0878***	0.0858***

	(0.00466)	(0.00466)
Number children household	0.0267***	0.0268***
	(0.00462)	(0.00463)
Number working household	0.178***	0.180***
	(0.00384)	(0.00384)
Size household	-0.0131***	-0.0133***
	(0.00340)	(0.00341)
Urban	0.197***	0.197***
	(0.00828)	(0.00828)
Aguas Calientes	0.00807	0.00925
	(0.0249)	(0.0248)
Baja California	0.276***	0.276***
	(0.0249)	(0.0249)
Baja California Sur	0.327***	0.324***
	(0.0263)	(0.0263)
Ciahuila	0.0968***	0.0983***
	(0.0238)	(0.0238)
Colima	0.108***	0.109***
	(0.0246)	(0.0246)
Chiapas	-0.217***	-0.215***
	(0.0246)	(0.0246)
Chihuahua	0.0132	0.0152
	(0.0246)	(0.0246)
Distrito Federal	0.316***	0.313***
	(0.0241)	(0.0241)
Durango	-0.0194	-0.0179
	(0.0249)	(0.0249)
Guanajuato	0.0589**	0.0601**
	(0.0244)	(0.0244)
Guerrero	-0.284***	-0.284***
	(0.0284)	(0.0284)
Hidalgo	-0.0114	-0.0113
	(0.0242)	(0.0242)
Jalisco	0.0742***	0.0764***
	(0.0251)	(0.0251)
Mexico	-0.0213	-0.0199
	(0.0232)	(0.0231)
Michiacan	0.0931***	0.0928***
	(0.0241)	(0.0241)
Morelos	0.0477*	0.0475*
	(0.0249)	(0.0249)
Nayarit	-0.119***	-0.120***
	(0.0271)	(0.0271)
Nuevo Leon	0.311***	0.312***
	(0.0257)	(0.0257)
Oaxaca	-0.297***	-0.298***
	(0.0262)	(0.0262)
Puebla	-0.0864***	-0.0858***
	(0.0239)	(0.0239)
Queretaro	0.339***	0.341***
	(0.0256)	(0.0256)
Quintana Roo	0.217***	0.219***
	(0.0248)	(0.0248)
Sinaloa	0.0894***	0.0885***
	(0.0255)	(0.0255)
Sonora	0.271***	0.273***
	(0.0271)	(0.0271)
Tabasco	0.161***	0.160***
	(0.0273)	(0.0274)

Tamaulipas	0.0523**	0.0541**
	(0.0260)	(0.0260)
Tlaxcala	-0.0861***	-0.0853***
	(0.0240)	(0.0240)
Veracruz	-0.00230	-0.00328
	(0.0242)	(0.0241)
Yucatan	0.00667	0.00724
	(0.0228)	(0.0228)
Zacatecas	-0.171***	-0.170***
	(0.0254)	(0.0253)
Campeche	0.163***	0.163***
	(0.0255)	(0.0255)
Female head of the household	0.0288***	0.0271***
	(0.00894)	(0.00893)
Age head of the household	0.00595***	0.00570***
	(0.00133)	(0.00133)
Age squared head of the household	-2.62e-05**	-2.38e-05*
	(1.24e-05)	(1.25e-05)
Incomplete primary school head of the household	0.0999***	0.0985***
	(0.0115)	(0.0115)
Complete primary school head of the household	0.233***	0.231***
	(0.0125)	(0.0126)
Incomplete secondary school head of the household	0.327***	0.323***
	(0.0184)	(0.0184)
Complete secondary school head of the household	0.370***	0.369***
	(0.0131)	(0.0131)
Incomplete high school head of the household	0.473***	0.473***
	(0.0232)	(0.0232)
Complete high school head of the household	0.568***	0.566***
	(0.0166)	(0.0166)
Incomplete undergraduate head of the household	0.762***	0.762***
	(0.0253)	(0.0252)
Complete undergraduate head of the household	1.037***	1.037***
	(0.0184)	(0.0184)
Graduate studies head of the household	1.491***	1.492***
	(0.0340)	(0.0340)
Working head of the household	-0.165***	-0.169***
	(0.0108)	(0.0109)
Divorce head of the household	0.00759	0.00496
	(0.0129)	(0.0129)
Widower head of the household	0.0536**	0.0513**
	(0.0255)	(0.0256)
Married head of the household	-0.0475***	-0.0503***
	(0.0142)	(0.0142)
Own dwelling	0.0632***	0.0640***
	(0.00893)	(0.00892)
Rent dwelling	-0.0700***	-0.0696***
	(0.0126)	(0.0126)
Poorest 40%	-0.410***	-0.409***
	(0.00873)	(0.00873)
Food insecurity	-0.159***	-0.160***
	(0.00780)	(0.00778)
No school attendance	-0.0562***	-0.0564***
	(0.00989)	(0.00989)
Constant	9.085***	9.099***

	(0.0427)	(0.0429)
Observations	33,641	33,641
R-squared	0.536	0.536

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Both variables associated with disability (*presence of at least one member with disability in the household* and *head of household with disability*) had the expected effects on the levels of household income. In model A households with disabled members had an income level 5.4% lower compared to households without disabled members. In model B, the effect of having a head of household with disability was negative, with a reduction by 6.5%.

Contrary to what happened in previous years, when the number of children or elderly members of household increases by one, there was an increase in the levels of household income by 3% and 9%, respectively. As in previous years, an increase of one in the number of working members had a positive effect on the levels of household income, increasing it by 18%. People living in urban areas had an income level 20% higher than those living in rural areas. In addition, people living in the Distrito Federal Nuevo Leon and Baja California Sur had a household income 30% higher than those living in San Louis Potosi. People living in Oaxaca , Guerrero and Chiapas had the highest reduction in their levels of income (more than 28%).

As in previous years, the levels of education of the head of the household had a significant and positive effect on the final levels of household income. The largest effect was observed when the head of the household had a level of education of graduate or higher, with an increase by more than 100%. As in the previous years, female heads of households had a positive and significant effect on the levels of household income compared to households with male heads. Finally, when the head of the household was married, divorced or a widow/er the levels of

household income were higher compared to households with single heads. It is important to recognise that the effect of the variable female head of the household changed when variables associated with marital status of the head of the household were not included.

Other independent variables included had the expected effects on the levels of household income. Indeed, when the person was living in households in the poorest 40% according to the asset index, their income was 41% lower than when the household was not in the poorest 40%. As was expected households with moderate food insecurity had lower levels of income compared to households without food insecurity and if at least one school age child in a household did not attend school the level of income of that household decreased by 5.6%.

6.4. MEXICO: CONCLUSION

In the three years included for Mexico in this study, the levels of income poverty of households with disabled members in Mexico were lower compared to households without disabled members. On average the reduction was around 5%. In cases where the variable head of the household with disability was analysed, the reduction in the levels of household income was on average 6%. In all models estimated the variables were significant and had the same sign.

Most variables included in the analysis produced the expected effect on the levels of income. The only case with a contrary effect to that expected was female head of household, but this positive effect was obtained when the model was controlled by marital status of the head of the household. In the three years, households with a female head had a level of income 3% to 4% higher than households with male heads.

7. SUMMARY OF THE FINDINGS

The results of the five countries revealed that households with disabled members had a higher probability to be classified as poor or considering themselves as poor, compared to households without disabled members. In addition, when the analysis included heads of household with a disability, the results indicated that the levels of income of those households were lower compared to households with a non-disabled head. Comparing both findings the effect of head of the household with disability was always higher, meaning that when the disabled member is the head, the risk of poverty of those households is higher than when other member of the household is disabled.

Other variables related to household characteristics, area and region had the expected results in each country. Particular exceptions were the fact that in Chile and in Colombia (2010) the probability of income or subjective poverty increased in urban areas. In addition, in Mexico households with female heads had a lower probability of poverty when marital status of the head of the household was included as a control variable(s) in the analysis. In all models, the most influential variables were related to head of household level of education, increasing the levels of income by more than 100% when the head had a graduate degree compared to no education. As expected in all estimations, variables related to *40% poorest according to the asset index, food insecurity and school attendance* had a negative effect on the levels of household income and increased the probability of poverty (subjective and objective).

In the analysis of the data from Chile and Brazil, a variable disability and poverty was included. This variable was the interaction between disability (*presence of at least one member with disability in the household*) and being classified as poor according to the asset index (*40% poorest per assets*) and it represented "poor" households (with lack of assets) with disabled members. In all cases that included this variable, the results suggested that individuals living in poor households with disabled members have a lower probability of being classified as poor compared to poor households only or households with disabled members only. In cases when this variable was included as a control, the variable *presence of at least one member with disabilities household* had a negative effect on the levels of income and on the probability of being classified as poor. The causes of these effects should be a point of discussion for future research in the field of disability, poverty and social assistance.

When data from the same country in different years was analysed, the results were similar for all the years and models. Indeed, in the three countries that included data at more than one point in time (Chile, Colombia and Mexico) the effects of the variables associated with disability were similar. Chile was a particular case, given than in 2009 the results for the first model (official measure of poverty) showed that *the presence of at least one member with disability* and *head of the household with disability* had a negative effect on the probability of being classified as poor. When the generalized ordinal logit was estimated, it was found that head of the household with disability was positively associated with being classified as poor but not extremely poor. Possible explanations to the unexpected result are related to the type of dependent variable that was included in the model, a possible

association between disabled and working members in a household. Nevertheless, when model 2 was estimated using the *logarithm of household income* as the dependent variable, a negative relationship between the variables disability and poverty was found.

As was discussed in the case of Chile in 2009 and 2011 the variable *disability*poverty* was included in the models. In 2006 this variable was insignificant and did not increase the explanatory power of the model, contrary to 2009 and 2011, where the variable was significant and positively associated with the reduction of the probability of being classified as poor and an increase on household income. One possible explanation to the effect of this variable is the existence of social assistance programmes, whose main objective is to increase the levels of available income for poor households with disabled members.

In the case of Colombia, a subjective measure of poverty was included as the dependent variable and the results were similar to those obtained for other countries. Indeed, this fact reveals that disability has an impact not only on income, assets or consumption, but also in how people perceive themselves as poor or non-poor, and to some extent it reflects the negative effect that discrimination and social exclusion have on the lives of people with disabilities and their families. Even though, the use of subjective measures of poverty have been questioned (Gandhi and Knight, 2006, Ravallion and Lokshin, 2001), for this case, it was important to analyse that disability does not only affect objective aspects of poverty, but it also has an important influence on how households with disabled members perceive themselves as poor. It was not possible to conduct an analysis using objective measures and to compare the results, mainly due to a lack of

available data, however, similar results were observed when a multidimensional measure of poverty was used (see chapter 9 for details).

In the case of Mexico, households with disabled members had a lower household income compared to households without disabled members. Comparing the magnitudes of the reduction of household income, in 2008, households with disabled members had an income 2% lower, in 2010 it was 4% and in 2012 it was 5.4%. Although, this study used cross-sectional data and the same individuals are not interview during the three years, the results revealed that the effect of disability has increased in the last years and the risk of income poverty for households with disabled members has also increased. In 2010 and 2012, the variable *head of the household with disability* was included in the analysis. As expected, households whose head had a disability had a reduction in their levels of income by 7.4% in 2010 and by 6.5% in 2012.

Two countries included only information at one point in time: Brazil and Costa Rica. In the first case, the main limitation was the type of questions on disability included in the survey. Indeed, only two types of impairment were included (mobility and ADL) and only individuals older than 14 that referred to have a mild or not limitation or ADL were asked to answer mobility questions. Whilst the limitations of working with these questions have been acknowledged, it was decided that given the importance of Brazil in the region, its socioeconomic characteristics and type of social protection system and lack of other sources of information; this data source was used for the analysis. In general, the results suggested that the presence of a person with ADL or mobility limitations in a household had a negative effect on the levels of household income, increasing the

probability of living with less than one minimum monthly wage. As was anticipated, given the two types of impairments included in the survey, the age of people with disabilities was on average higher than the average age. The average age of people living with ADL impairment was higher than the one for people with mobility limitations. It is expected that in Brazil the prevalence of disability would be higher and the effect of disability on the levels of household income is also higher than that observed in this study.

In Costa Rica the analysis included as the dependent variable the indicator of UBN. This variable is a direct measure of poverty that included five categories. Although currently the UBN has lost its popularity, it is still widely used in LA. The results indicate that households with disabled members had a higher probability of having more than 2 UBN, probability that increased when the analysis included the variable *head of the household with disability*. Some limitations of the analysis are that the population census was used as the data source, it did not include a large number of sociodemographic questions, the information was collected during 2000 and it does not reflect changes in the legislation and social policies that had happened in the last decade[23]. Nevertheless, the results are consistent with expectations. Households with disabled members had a higher probability of having two or more UBN.

As a consequence that the household was selected as the level of analysis, it was not possible to study if people with disability had access (or not) to basic services such as education and health. The descriptive analysis suggested that people with

[23] Information from the National Household Survey from 2010, 2011 and 2012 was obtained at the end of the analysis; given the time constraints a detailed analysis was not conducted. However, in a general analysis no differences were found with the results presented in this study.

disabilities in the five countries have lower levels of education and higher unemployment rates compared to non-disabled individuals. In the three countries where data from three points in time existed, there were no significant improvements in their access to education or health when the information between years was compared. Although, the final objective of this thesis was not to analyse the level of access to basic opportunities of people with disabilities or to analyse how different impairments increase/decrease the probability of access to those services, descriptive statistics give an insight into the lack of access to these opportunities for individuals with disabilities.

In general, the results of this chapter proved the hypothesis that households with disabled members have a higher risk of poverty compared to households without disabled members. Moreover, in all cases (except Chile 2009) the presence of at least one member with disability in the household reduced the levels of income and increased the probability of poverty (subjective or objective). In this analysis different types of measures of poverty were included as dependent variables. In the case of Colombia, only subjective measures were included and it was not possible to include other types of measures in this stage of the analysis. Nevertheless, the results revealed that the presence of a member with a disability increases the probability of perceiving themselves as poor. This finding contrast with the ones presented by Mitra et al. (2013b), where there was not a significant association between income poverty and disability.

Using secondary data for the analysis of disability has disadvantages related to how concepts were operationalized and the number or attributes included in this process. Indeed, different disability measures exist; these usually vary in how

disability is understood and what population the questions capture (Altman, 2014). Two types of measurement error are common when collecting data on disability: observational and non-observational error as was discussed in chapter 6. For this study, it is expected that Brazil has a high level of observational error and the results do not reflect the real magnitude of people with disabilities in this country. In those countries where disability questions were at the household level, higher levels of observational error may be presented compared to those who asked the questions at the individual level.

In the five countries included in this study similar results were found (Table 8. 27). Given that a most different system design was implemented to select the cases and micro-data was the source of information; it was assumed that the criteria of selection did not affected the results. Although no direct comparisons can be made between countries because of differences between dependent and independent variables and the years over which the information was collected, it is possible to say that in LA households with disabled members had a higher probability of being poor compared to households without disabled members.

TABLE 8. 27. GENERAL RESULTS ALL COUNTRIES AND ALL YEARS

Country	**Year**	**Dependent variable**	**Disability household effect**	**Disability head effect**
Brazil	2008	Logarithm household income	3.5% reduction	ADL 13% reduction Mobility 12% reduction
		Income classification: Poor	1% increase probability	ADL 5.5% increase probability Mobility 4.2% increase probability
Chile	2006	Objective measure of poverty: Basic consumption basket. Poor	1.7% increase probability	1% increase probability
		Logarithm household income	3.8% reduction income	7% reduction income
	2009	Objective measure of poverty: Basic consumption basket.	1.5% reduction probability	1% reduction probability

		Poor		
		Logarithm household income	2.2% reduction income	3.3% reduction income
	2011	Objective measure of poverty: Basic consumption basket. Poor	1.7% increase probability	1.3% increase probability
		Logarithm household income	8 % reduction income	13.7% reduction income
Colombia	2008	Subjective perception of poverty	4% increase probability	N/A
	2010	Subjective perception of poverty	5% increase probability	5. 7% increase probability
	2011	Subjective perception of poverty	6 % increase probability	N/A
Costa Rica	2000	UBN More than 2 UBN	1.6% increase probability of 2 or more UBN	1.1% increases probability of 2 or more UBN
Mexico	2008	Logarithm household income	2.3 % reduction income	N/A
	2010	Logarithm household income	4 % reduction income	7.3 % reduction income
	2012	Logarithm household income	5.4 % reduction income	6.5 % reduction income

8. General Conclusions

In the five countries similar tendencies were found. In all the countries households with disabled members had a higher probability of poverty (subjective or objective). The magnitude of the effect of the presence of a member with a disability in the household cannot be compared between countries, but it is extremely important to highlight that no matter what measure of poverty was used as the dependent variable, disability is associated with a perception of poverty, lower levels of household income and being classified as poor according to national measures of poverty.

In Colombia the probability of subjective poverty for households with disabled members increased in the three years. The same happened in the case of Mexico, where disability had a negative effect on the levels of household income for households with disabled members. Although the results from Brazil cannot be generalized for the whole population with disabilities in the country, the results

confirm the hypothesis of this study: *households with disabled members have a higher risk of poverty.*

CHAPTER 9

COMPARATIVE ANALYSIS: MULTIDIMENSIONAL POVERTY OF HOUSEHOLDS WITH DISABLED MEMBERS

1. INTRODUCTION

In addition to the analysis of the risk of poverty for households with disabled members using *indirect measures* (Chapter 8), this chapter presents the results of the analysis of *multidimensional poverty* of households with disabled members in five LA countries. As was discussed in chapters 2 and 3 approaches to define poverty and disability have changed in the last decades. In the case of poverty, it has been recognised that being poor is not only associated with access to material resources or income, but also to the options a person has in order to choose the life s/he values to live. In addition, currently disability is widely understood as the result of the interaction between a health condition and environmental factors that act as barriers for the social inclusion of the individual.

Disability and poverty are related conditions. The cyclical relationship between these two conditions has been recognised globally and as discussed in chapter 4, disability increases the risk of becoming poor and poverty of becoming disabled. The relationship between these two conditions is mediated by the existences of social exclusion processes, which reduce the access to basic opportunities and services such as education, health and labour. In this context, it has also been identified that indirect measures of poverty do not capture the magnitude of direct, indirect and opportunity costs that disabled people and their families face (Kuklys, 2005).

In the last decades, different measures of multidimensional poverty have been proposed (Alkire and Foster, 2011b, A. B. Atkinson, 2003, Bossert et al., 2013, Bourguignon and Chakrravarty, 2003, Thorbecke, 2005, Tsui, 2002). All have recognised the need to include more than an income dimension in the analysis of poverty. Alkire and Foster (2011a) developed a method to measure multidimensional poverty, using a counting and an axiomatic approach to construct poverty measures. Since 2010, a global multidimensional poverty index (global MPI) based on the Alkire-Foster (A-F) methodology has been included as a measure of acute poverty by the UNDP in the Human Development Reports. The global MPI is composed by three dimensions (health, education and living standards) and defines that a household is multidimensionally poor if the level of deprivations of their members are higher than a poverty cutoff equal to 33%[24].

The A-F methodology is based on the capability approach. This methodology identifies and aggregates poor individuals in a country, using a double cutoff approach, as will be explained in more detail in this chapter. It has different desirable axiomatic properties, allowing the analysis between groups and the contribution of each dimension and indicator to the final value of multidimensional poverty. Colombia, Mexico and most recently Chile (January 2015) have designed and use a national multidimensional poverty index based on this methodology.

The main objective of this chapter is to provide empirical evidence to answer the fourth research question of this thesis. Indeed, the results of this chapter will give evidence on i) how the levels of multidimensional poverty change (or not) between households with and without disabled members; ii) what dimensions have the

[24] This poverty cutoff is equivalent to being deprived in at least one dimension, or a combination of deprivations in different indicators that sum more than 33%.

highest deprivations for this group and iii) how much households with disabled members contribute to the national levels of multidimensional poverty. In addition, a comparative analysis between countries is conducted.

A global MPI was calculated using data from the latest population census available for each of the countries (Brazil, Chile, Colombia, Costa Rica and Mexico). Similar dimensions to the ones included in the global MPI were used, but higher dimension cutoffs in some indicators were implemented. The poverty cutoff used in this study was 34% (instead of 33%), meaning that a household was considered multidimensionally poor, if it was deprived in one or more dimensions (or the equivalent in a number of indicators).

This chapter is divided into six parts including this introduction. Next, the MPI is introduced, a description of the methodology is presented and the global MPI is characterized. Then a detailed description of the data sources is provided, followed by a discussion of normative decisions related to the level of analysis, dimensions, indicators and dimension and poverty cutoffs. The final sections present the main results of the analysis and the main conclusion.

2. MULTIDIMENSIONAL POVERTY INDEX (MPI)

During the last two decades, it has been recognised that poverty is a multidimensional condition. It cannot be determined only by access to commodities or goods, but to how individual (or households) convert those into valuable beings and doings. Since the first publication of the Human Development

Report (1990) and following the Capability Approach[25], the understanding of development and poverty has moved from a unidimensional to a multidimensional perspective; understanding poverty not only as a lack of income, but also as the deprivation of basic capabilities (Sen, 1999).

As a result of changes in the perspective of understanding poverty, different direct measures have been proposed during the last decade (Alkire and Foster, 2011b, A. B. Atkinson, 2003, Bossert et al., 2013, Bourguignon and Chakrravarty, 2003, Thorbecke, 2005, Tsui, 2002). Although, not all measurements were based on the Capability Approach, all recognise the importance of creating measures using different dimensions of development and of identifying and aggregating poverty in an index.

In order to propose a measure of multidimensional poverty, a large number of methodologies have been used. Some of these are: theory of fuzzy sets, information theory, efficiency analysis and axiomatic derivations (Deutsch and Silber, 2005). Using a counting and an axiomatic approach to construct poverty measures, Alkire and Foster (2011a) developed one of the most currently used methods to measure multidimensional poverty. The MPI was defined as an index that "*identifies overlapping deprivations suffered by households in health, education and living standards*" (UNDP, 2010 p. 86). The index recognises that poverty is a multidimensional phenomenon and aspects related to individual capabilities and functioning should be at the centre of the analysis (Alkire and Santos, 2013b).

[25] Other approaches to understand poverty exist in the literature, one example is the Basic Needs Approach (Stewart, 1985)

2.1. ALKIRE-FOSTER METHODOLOGY

The A-F methodology uses a double cutoff, meaning that it identifies individuals deprived in each dimension and those that are multidimensionally poor. At the first stage, people with levels lower to a specific threshold in each dimension are identified then using an intersection, union or intermediate approach[26] a poverty cutoff is established. This cutoff represents the number of dimensions that someone should be deprived in, in order to be considered multidimensionally poor (Alkire et al., 2013a, Alkire and Foster, 2011a, Alkire and Santos, 2010, Alkire and Santos, 2013b, Santos and Alkire, 2011).

The axiomatic properties of this index are: decomposability; replication invariance; poverty focus; monotonicity; dimensional monotonicity; nontrivially; normalisation; weak transfer and weak rearrangement (for details see Alkire and Foster, 2011a). These properties allow a better and in-depth analysis of the situation of multidimensional poverty in a country. They also guarantee that common problems related to unidimensional measures of poverty (e.g. headcount or poverty gap) are avoided.

A number of normative decisions should be made before estimating a MPI. They are related to what dimensions, indicators, weights and cutoffs are the most appropriate and reflect the reality of the context. The number of individuals or households identified by the measure will depend on the selection of these four aspects. Therefore, the use of at least one of the following methods is

[26] Under the union criteria a person is identified as poor if it is deprived in one dimension. Using an intersection criteria a person is considered poor if she is deprived in all dimensions and an intermediate approach identifies a poor person using an intermediate cutoff between the union and the intersection approach (A.B. Atkinson, 2003)

recommended: 1) selection of dimensions and indicators based on the data, each indicator will be determined by the availability and quality of the data; 2) implicit or explicit assumptions about the aspects individuals in a society value; 3) public "consensus", such as the Universal Human Rights Declarations or the MDGs; 4) participatory processes and 5) empirical evidence (Alkire, 2007a). The most recommended is participatory methods, aiming to develop a measure that reflects the reality of the population. However, when it is not possible to use this method, it is recommended to combine at least two or more methods.

The method of calculation of the MPI follow a number of steps that can be summarized in the following way (Alkire and Santos, 2013a):

1. Defining the dimensions and indicators to be considered
2. Determining the deprivation cutoffs for each indicator
3. Applying the cutoffs to identify if each individual is deprived or not in each dimension
4. Selecting a relative weight for each dimension and each indicator
5. Determining the poverty cutoff, which is the proportion of weighted deprivations that a person (or household) needs to be considered as poor
6. Creating a weighted proportion of deprivations for each person. This proportion will define who is or who is not poor according to the poverty cutoff
7. Computing the multidimensional headcount ratio (H)[27] and the intensity of poverty (A)[28]

[27] The multidimensional headcount is the proportion of people whose weighted deprivation is $c(k) \geq k$ and it is calculated $H = \frac{q}{n}$ where q is the number of people who are multidimensionally poor and n is the total population (Alkire and Santos, 2010; Alkire et al. 2011).

8. Finally, computing the adjusted headcount ($M0$)[29], which is the product of the headcount and the intensity of poverty.

After the final calculation of the headcount, the intensity and the adjusted headcount, different types of robustness and sensibility tests should be implemented. This is to guarantee that the measure captures the real levels of multidimensional poverty in a specific population.

Some of the advantages of using the A-F methodology are the possibility of including different dimensions, indicators and weights into a common index. Moreover, it is possible to compare the levels of poverty between groups, aspects that facilitate the analysis of how each group contributes to the total multidimensional poverty in a country. This is extremely important when the levels of poverty for households with disabled members are analysed.

In general, the A-F methodology allows the calculation of an index that measures the levels of multidimensional poverty in a country. It is also possible to analyse the contribution of different dimensions, indicators and groups to the level of national poverty. In this respect, the methodology provides guidelines to the estimation of the index, but it gives space to include aspects related to national or regional characteristics that affect the levels of poverty in that specific context. Nevertheless, a global MPI has been calculated, in order to compare the levels of acute multidimensional poverty of countries around the world. This implementation only provides an example of the type of information included in the index.

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[28] The intensity of poverty is the average deprivation score of people multidimensionally poor and it is expressed $A = \frac{\sum_{i=1}^{n} c_{i\,(k)}}{q}$ where $c_{i\,(k)}$ is the censored deprivation score of individual i and q is the number of people who are multidimensionally poor (Alkire and Santos, 2010; Alkire et al. 2011).

[29] $M0 = H * A$

2.2. THE GLOBAL MPI

The global MPI measures acute multidimensional poverty. It was first presented in the Human Development Report in 2010 and it is based on the A-F methodology. The index was estimated for 104 countries in 2010 and it has been updated since then. Three dimensions were included into the analysis: education, health and standard of living. Each dimension had a set of indicators, in total 10 indicators were included (2 for health, 2 for education and 6 for living standards). Nested weights were used, meaning dimensions were equally weighted (1/3 each) and indicators in each dimension had an equivalent weight (Alkire and Santos, 2010, Santos and Alkire, 2011).

Four mechanisms are usually used to select dimensions included in a multidimensional measure: revising literature working with participatory methods; theory based selection; consensus using the MDGs and the Human Rights Convention as a base and finally the availability of data. The final three dimensions mirror those included in the HDI; important aspects such as empowerment, work, safety or environment were not included because of the nonexistence of data. However, the dimensions responded to a general consensus, are easily interpretable and are possible to measure using the currently existing data (Alkire and Santos, 2010). The A-F methodology allows the analysis of poverty at different levels, depending on the purpose of the measure. Given that this index aimed to identify acute poverty and deprivations in aspects related to the MDGs, it was calculated at the household level.

The MPI was calculated aiming to track some of the MDGs. Eight of the ten indicators responded to a specific goal and two (Floor and electricity) provided

information related to housing conditions, which can be used as proxy in the analysis of poverty (Alkire and Santos, 2010). A detailed explanation of each indicator and their deprivation cutoff is outside the scope of this document, however it can be found in Alkire and Santos (2010). Table 9.1 presents the dimensions, indicators, deprivation thresholds and weights used by the global MPI.

TABLE 9. 1. DIMENSIONS, INDICATORS, DEPRIVATIONS THRESHOLDS AND WEIGHTS USED BY THE MPI.

Dimension	Indicator	Deprived if...	Related to	Relative weight
Education	Years of Schooling	No household member has completed five years of schooling	MDG2	1/6
	Child school attendance	Any school-aged child is not attending school up to class 8	MDG2	1/6
Health	Child mortality	Any child has died in the family	MDG4	1/6
	Nutrition	Any adult or child for whom there is nutritional information is malnourished	MDG1	1/6
Living Standards	Electricity	The household has no electricity		1/18
	Improved sanitation	The household's sanitation facility is not improved (according to MDG guideline) or it is improved but shared with other households	MDG7	1/18
	Safe drinking water	The household does not have access to safe drinking water or safe drinking water is more than a 30-minute walk from home round trip	MDG7	1/18
	Flooring	The household has a dirt, sand or dung floor		1/18
	Cooking fuel	The household cooks with dung, wood or charcoal	MDG7	1/18
	Assets ownership	The household does not own more than one radio, TV telephone, bike, motorbike or refrigerator and does not own a car or truck	MDG7	1/18

Reproduction from Alkire and Santos (2010)

The poverty cutoff used by the MPI was 30% in 2010 and 33% after 2011. This means that a household was considered poor if the share of weighted deprivations was higher than 33%. Since 2011 those individuals living in households with thresholds between 20% and 33% were considered vulnerable and those whose values were higher than 50% were in severe poverty (Alkire et al., 2011).

In conclusion, the MPI is based on the A-F methodology. Since 2010 the MPI has been estimated each year for a higher number of countries, each year new data sources are included and sub-national decompositions and time series comparisons are conducted.

2.3. EMPIRICAL EVIDENCE IN LA

In addition to the LA countries included in the estimations of the global MPI (18 countries); other implementations exist using different data sources, dimensions, indicators and weights. Furthermore, some LA countries have calculated a national multidimensional index using specific information for their own context. Mexico was the first country to implement the A-F methodology in the measurement of multidimensional poverty (Foster, 2007).

Acknowledging differences between LA and other developing regions, Battiston et al. (2009) calculated the levels of multidimensional poverty of six LA countries (Argentina, Brazil, Chile, El Salvador, Mexico and Uruguay). Different indicators were included: income; children in school; education of head of household; running water; sanitation and shelter. Most of those indicators were associated with the UBN approach, which was the main approach to measure poverty during the 1990s and 2000s in LA. The results of the study suggested that El Salvador was the country with the highest level of multidimensional poverty and Chile with the lowest. However, when the index was decomposed by rural and urban areas, differences within countries were evident, reflecting that rural areas in Chile had the same levels of multidimensional poverty as El Salvador. The analysis per indicator indicated that access to *basic sanitation* and *education of the head of*

household were the factors that contributed the most to the levels of multidimensional poverty (Battiston et al., 2009).

Another regional study using a multidimensional measure was Roche and Santos (2012). This study used the same dimensions, indicators and weights included by the global MPI, but it analysed how a different set of weights and cutoffs (deprivation and poverty) affected the levels of multidimensional poverty in 18 LA countries. It also proposed the need to include indicators that reflect the reality of LA countries. In January 2015, the ECLAC presented a MPI for LA countries[30] (ECLAC, 2015). This proposal is composed by 13 indicator and 5 dimensions (housing, basic services, living standards, education and employment and social protection). The main findings were that the poverty incidence is higher than 70% in Central America countries and higher than 50% in other countries. Brazil, Costa Rica and Venezuela had the lowest headcount ratios (between 30 and 40%). The intensity of poverty differs between countries, with the highest levels in countries with the highest poverty rates (higher than 45%). Finally, the ranking of countries according to the M0 follows similar patterns than with the incidence (H) (see Santos et al. (2015) for details).

In addition to the regional analysis reviewed above, Mexico, Colombia and Chile have their own national MPI and more LA countries are in the process of construction, some examples are El Salvador, Costa Rica, Honduras and Ecuador. Some of the most common dimensions and indicators included are income, education, health and household characteristics. Each country has set a different structure of weights, which is applied to each dimension or set of indicators. In the

[30] This index was not used in the analysis because it was published after the analysis was conducted, and the information of each indicator cannot be obtained using Census data.

case of Mexico, two main aspects were included, income and a social deprivation index. Each of these aspects was given a weight of 0.5, in this country a person is considered multidimensionally poor if s/he is deprived in the dimension of income and in some other indicator (Foster, 2007). The second example is Colombia, this country included five dimensions: household education conditions, childhood and youth conditions, employment, health and access to public utilities and housing conditions, each of these dimensions was equally weighted and indicators inside each dimension were given the same weight. In Colombia, the level of analysis is the household and the poverty cutoff was 33%, meaning that a household is multidimensionally poor if is deprived in 33% or more dimensions (Angulo-Salazar et al., 2011, Angulo-Salazar et al., 2013).

Chile uses a multidimensional poverty measure to complement the income poverty measure that has been used for the last two decades. In this case, five dimensions were included: education, health, employment and social security, household characteristics and networks and environment; each dimension has the same weight (20%) and the poverty cutoff is 33%. Given that the multidimensional poverty complements the income measure, a person is considered poor if her/his income is lower than the national poverty line and is or is not multidimensionally poor. Additionally, a person is extremely poor if she has an income lower than the extreme poverty line and is multidimensionally poor (Comisión para la medición de la pobreza, 2014). Finally, one MPI proposed for Ecuador includes four dimensions: education, health, employment and household characteristics. Each dimension is equally weighted and each indicator has the same weight inside the

dimension, and a person is considered multidimensionally poor if s/he is deprived in more than 30% of the dimensions (Amores, 2014).

To summarise, a few studies have analysed the levels of multidimensional poverty in LA countries and have made comparisons with each other. These studies have identified important differences between countries and rural and urban areas, aspects that to some extent can be associated with the high levels of inequality of LA. Moreover, three countries have implemented and officially used an MPI as their national measure of multidimensional poverty and others are developing it. There is no further analysis concerning how the levels of multidimensional poverty change between groups or how different vulnerable groups contribute to national levels of multidimensional poverty.

2.4. EMPIRICAL EVIDENCE FOR PEOPLE WITH DISABILITIES

The MPI has been used on different occasions to define the levels of poverty for people with disability. The most influential application of this index in disability research is Mitra et al. (2013b). In this study the dimensions included were: education, employment, assets or living conditions, household expenditure and expenditure on health care services. The results suggested that people with disabilities living in middle and low income counties were deprived on a higher number of dimensions, compared to people without disability. Additionally, the adjusted headcount ratio was higher for people with disabilities and it was even higher for those individuals with multiple impairments. The authors found that education, health expenditure and employment were the dimensions with the highest contribution to the levels of multidimensional poverty for disabled individuals.

Two other studies have analysed the levels of multidimensional poverty of children with disabilities in Afghanistan (Trani et al., 2013, Trani and Cannings, 2013). The first study found that disabled children face higher levels of deprivation in indicators related to number of assets, social inclusion, education, autonomy and mobility. Additionally, the headcount and adjusted headcount are higher for disabled children aged 5 to 14 years. Similar finding were obtained by Trani and Cannings (2013). Indeed, disabled children had higher levels of deprivation in nine of the 14 dimensions included (nutrition, mental wellbeing, access to water, employment, education, love, care, land and mistreatment). In the analysis by gender, the authors found that girls with severe disability had higher levels of deprivation compared with other groups.

Other studies have contributed to the field of analysis of multidimensional poverty and disability. Nevertheless, those aimed to provide empirical evidence on the selection of dimensions and weights, using specific groups with psychiatric diagnoses (Mitra et al., 2013a) and not to conduct an analysis of multidimensional poverty for disabled individuals in developing countries. As was discussed in chapter 4, the empirical evidence of the relationship between disability and poverty has grown in the last decade. Nevertheless, there is only one published study that analyses the levels of poverty of people with disabilities using multidimensional poverty measures in countries around the world. Most of the studies that analyse the relationship between disability and poverty have used unidimensional or indirect measures of poverty. Only a few LA countries were included in the study of Mitra et al. (2013b) and there is no further empirical evidence on this topic using data for LA countries .

3. THIS STUDY

A multidimensional poverty index using the methodology proposed by Alkire and Foster (2011a) was calculated. The purpose was to fill the gap in knowledge about the levels of multidimensional poverty for people with disabilities in LA and to compare how those levels differ between the five LA countries included in this study.

The decision of selecting the A-F methodology was taken based on the several desirable axiomatic properties that this index has. This allows a detailed analysis of the levels of multidimensional poverty of households with disabled members. The most relevant properties are group and dimension divisibility. The first property is extremely important when levels of poverty between groups are compared. In the case of disability, this property allows the analysis of the contribution of this population to the national multidimensional poverty in a country. The second property enables a more detailed analysis and understanding of the levels of deprivation of poor households with disabled members.

The results of this analysis will provide knowledge that can inform policy decisions around disability. The identification of the dimensions and indicators that contribute the most to the levels of poverty of this group will produce the knowledge governments need to implement public policies that respond to the needs of this population. As people with disability are not explicitly mentioned in social policies covering basic needs such as access to sanitation or to a clean source of water, information on the levels of access to this type of basic service is

extremely valuable to make the adequate changes to guarantee that people with disabilities and their families have proper access to these services.

Data limitations are one if not the most important restrictions in the analysis of multidimensional poverty for different sub-groups. In the case of disability, the problem becomes more significant, given the difficulties to operationalize this concept (see chapter 6 for details). In most cases, surveys that include information related to living standards, education, health or employment do not include questions associated with disabilities or the questions included do not capture the population they aim to measure. Nevertheless, most countries in the region have included a short set of questions recommended by WG in their last population or household Census, making this source of data an option for the analysis of multidimensional poverty of households with disabled members.

The following sections present a more detailed discussion of each aspect of the estimation of the index. First the data sources are discussed and their levels of comparability are defined; then an explanation of the main reasons to select the household as the level of analysis is presented, followed by a discussion of the dimensions, indicators, weights and dimensions and poverty cutoffs.

3.1. DATA SOURCES

The sources of information were the last available household of population census in each country (Table 9.2). The selection of this source was due to the fact that the five countries included the set of questions suggested by the WG or a similar version. In addition, this was the most comparable data source that included questions on disability and dimensions of wellbeing.

The data from Chile, Colombia, Costa Rica and Mexico was downloaded from the IPUSM- International. In the case of Brazil, the data was obtained via the National Institute of Geography and Statistics (IBGE: Instituto Brasileiro de Geografia e Estatistica). Each sample constituted 10% of the population of each country

TABLE 9. 2. COUNTRY AND YEAR OF LATEST AVAILABLE CENSUS

Country	Year	Sample size
Brazil	2010	16.716.546
Chile	2002	1.513.914
Colombia	2005	4.006.168
Costa Rica	2000	381.500
Mexico	2010	11.938.402

One advantage of this source of information is the large number of cases included. However, censuses include a low number of questions related to important dimensions such as health (indicators relate to access to health care services, levels of individual health and levels of nutrition), labour and social participation.

3.2. LEVEL OF ANALYSIS

The level of analysis was the household. This decision was based on two main criteria: 1. disability is a situation that affects the individual and the family as was discussed in previous chapters and 2. availability of data. It was important to compare the results of the analysis between the five countries, therefore the same dimensions and indicators should be included in each analysis. Additionally, the household was also the level of analysis for the cross-sectional analysis (chapter 8).

3.3. DIMENSIONS

The dimensions used by the Global MPI (education, health and living standards) were used for this analysis. These dimensions are commonly included in the

analysis of poverty and deprivation. As was discussed in previous sections, eight of the ten indicators included in the global MPI respond to the MDGs. In this context, it is important to analyse if households with disabled members are deprived in those dimensions. The results will provide evidence on the levels of deprivation and multidimensional poverty of families with disabled members, and will reach awareness of the importance of the proper inclusion of this population in development goals.

It has been recognised that the dimensions included in the global MPI do not represent all the dimensions of poverty. Additionally, the fact that the index is calculated at the household level does not allow the analysis of individual deprivations. Nevertheless, most indicators represent deprivations in basic and rudimentary services that should be available for all the population. Dimensions related to employment, participation, income and empowerment should be included in the analysis of multidimensional poverty for people with disabilities. However, information on these topics is scarce in national surveys, especially in Census data.

3.4. INDICATORS

The indicators included in the analysis were similar to those used to calculate the global MPI. As a consequence of data constraints, it was not possible to include all the indicators or use some of them in the final estimation. In order to compare between countries, it was important to use similar indicators. In each country, the available indicators were included in the calculation of the index. Nevertheless in the robustness analysis a calculation of an index with the same number of

indicators was estimated and analysed (see appendix 7). Table 9.3 presents the indicators included in each country.

TABLE 9. 3. INDICATORS PER COUNTRY

Indicator	Brazil	Chile	Colombia	Costa Rica	Mexico
Child mortality	X	X	X	X	X
Malnutrition			X		
Years schooling	X	X	X	X	X
Child school attendance	X		X	X	X
Cooking fuel		X	X	X	X
Electricity	X	X	X	X	X
Water	X	X	X	X	X
Sanitation	X	X	X	X	X
Walls material [31]	X	X	X	X	X
Asset ownership	X	X	X	X	X

Indicators related to under-nutrition or food insecurity were only available in Colombia. In the case of Chile it was not possibility to calculate the indicator related to child school attendance, because census data did not include questions on this aspect. The definition of each indicator was different to the one used by the Global MPI. Nevertheless, a common definition was used between countries. Table 9.4 presents a description of each indicator.

TABLE 9.4. INDICATORS INCLUDED IN THE ANALYSIS

Indicator	Definition
Child mortality	Children born alive, but die in the last two years (no specific age)
Nutrition	As a result of lack of money the individual did not consume food, even when she/he was hungry
Years schooling	Number of years of schooling of household members older than 12 years old
Child school attendance	Children older than 5 and younger than 16 that are not attending to school
Cooking fuel	Any type of cooking fuel
Electricity	Any source of electricity
Water	Any source of water inside or outside the household
Sanitation	Type of sanitation systems used in the household
Walls material	Any type of wall material (including no walls)
Asset ownership	Six types of assets were included in this indicator. Five of them were included in all the countries (television, computer, fridge, car and washing machine) and one varied between countries.

[31] The global MPI includes floor material, but as a result of data constrains and to improve the levels of comparability wall material was included instead.

3.5. WEIGHTS

As in the global MPI, nested weights were used. As was discussed in the previous section, not all indicators were available in all the countries; therefore, in those dimensions where only one indicator was available, the weight assigned to it was equal to 1/3. For example, in the case of Colombia each indictor in the health dimension was weighted 1/6, by contrast in Chile, where no information on malnutrition was available, the indicator on child mortality was weighted 1/3. Detailed information on each indicator per country is provided in the appendix of each country.

The selection of weights is an important step in the definition of a multidimensional poverty index. This step is usually associated with a trade-off between dimensions, and aspects related to substitutability and complementarity become important in the discussion. Different techniques to select weights have been proposed (Alfares and Duffuaa, 2008, Chowdhury and Squire, 2006, Decancq and Lugo, 2010, Njong and Ningaye, 2008). Methods can be divided into three classes: data driven, normative and hybrid weighting. The first class (data driven) includes the use of multivariable analysis tools such as factor analysis or multi-correspondence analysis. Weights defined according to normative decisions should reflect the importance that each dimension has in the analysis, consultation with experts is also included. Finally, hybrid weights defines weights based on opinions of different groups (stated preference weights) or on implicit valuations of wellbeing or in the prices of the market (Decancq and Lugo, 2010).

Nevertheless the use of equal weights is commonly used in the literature, with the HDI, as one main example. In general, as a result of lack of consensus, difficulties in

the implementation of participatory approaches and difficulties in the interpretation of weights generated by multivariate techniques, the use of equal weights, when no other information is available is recommended. This implementations should be followed by robustness and sensitivity tests of the results (Tony Atkinson et al., 2002).

3.6. DIMENSION AND POVERTY CUTOFFS

The A-F methodology applies two types of cutoffs: dimension and poverty cutoffs. For this study, the dimension cutoffs were set higher than the ones used by the global MPI (Table 9.5). The main reasons were that LA as a region is considered to have middle to high human development levels. Additionally, previous applications of this methodology using data from LA have suggested the use of higher cutoffs (Roche and Santos, 2012).

The poverty cutoff was set at 34%, representing that a household was considered poor if it was deprived in more than one dimension. In cases where a dimension was represented by only one indicator, this threshold allowed that a household were deprived in that indicator but were not poor. As in the global MPI a vulnerability threshold was included for those households with a percentage of deprivation from 20% to 33%.

TABLE 9.5. DIMENSION CUTOFFS

Indicator	Deprived if…
Child mortality	The household has at least one death of children in the two years before the census.
Nutrition	As a result of lack of money at least one member of the household did not consume food in the previous week, even when he/she was hungry.
Years schooling	No household members older than 12 has more than six years of schooling (primary school)
Child school attendance	Households with children older than 6 years and younger than 16 not attending school
Cooking fuel	The household does not cook with natural gas or electricity
Electricity	The household has no electricity
Water	The household has no aqueduct inside the dwelling
Sanitation	The households has no access to public sanitation services or shares these services with other households
Walls material	The household does not have brick (or similar material) walls[32]
Asset ownership	The household does not own more than two assets (see appendix for details for each country) or a car.

In order to analyse how levels of multidimensional poverty changed, the deprivation cutoffs were higher compared to the global MPI. Some examples are years of schooling (the household is deprived if at least one member older than 12 does not have 5 years of education) and asset ownership (the household does not own two or more assets).

3.7. SUBGROUP DECOMPOSITION

In order to analyse the levels of poverty of households with members with disabilities a subgroup analysis was conducted. The contribution of those households to the general multidimensional poverty was computed using the following formula:

$$MPI = \frac{\frac{n_x}{n} MPI_x}{MPI_{total}} * 100$$

Where *x* is the subgroup of interest, in this case, households with disabled members.

[32] Each country had different list of walls materials, tables in the appendix describe in detail the other material accepted to consider as not deprived the household in this indicator.

This analysis allows a better understanding of the levels of multidimensional poverty of households with disabled members, and a description of how much these households contribute to the national multidimensional poverty levels.

3.8. DISABILITY DEFINITION

In the five censuses used for this study, disability was measured using similar questions or equal questions to the ones recommended by the WG, which are related to functionality (see table 6.9 for details on the questions). A person was defined as disabled if they answered that s/he had any type of difficulty. Households with at least one member with any type of difficulties were defined as households with disabled members, and all their members were assumed as *members of households with disabled members*. In this point was not possible to consider aspects related to the severity of the difficulty, given that some countries did not include questions on this in there Censuses.

3.9. MISSING VALUES

The data sources included information about people living in institutions and jails. However, this information was not included in the analysis. The reasons were that the household was the level of analysis and characteristics of the dwelling were part of the indicators included in the index, and individuals living in institutions and jails did not have information on these variables. In addition, the index was calculated using indicators without missing values, in other words, all observations with missing values in one of the indicators were not included in the final analysis (listwise deletion). The percentage of missing values in each country varied between less than 1% in Costa Rica to 7% in Mexico.

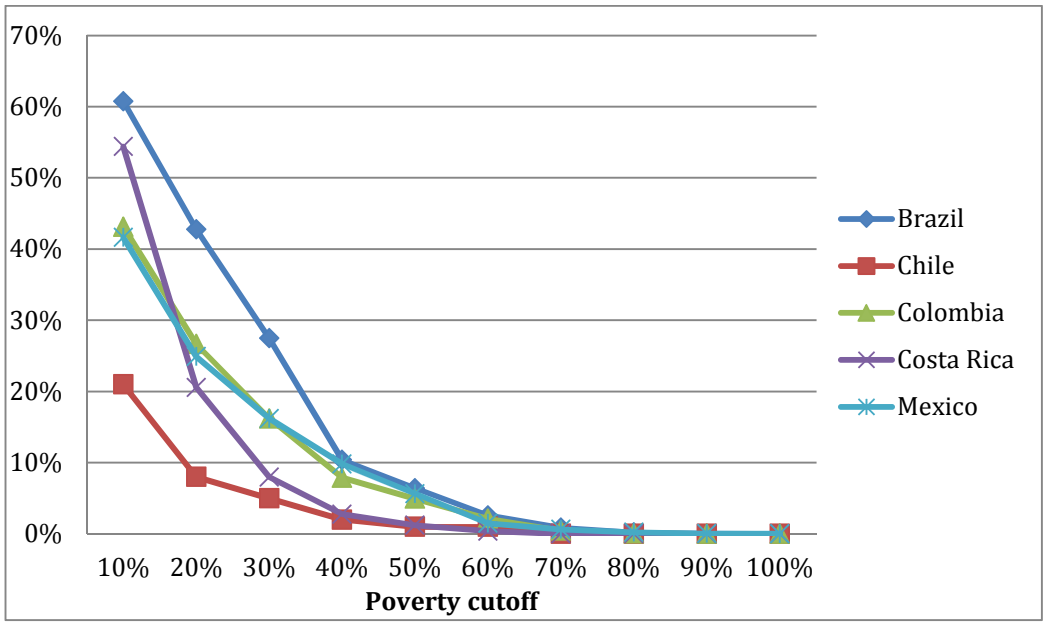
4. RESULTS

This section presents the comparative result of the levels of multidimensional poverty of households with members with disability in five LA countries. The general findings in each country are presented and a comparison between levels of multidimensional poverty of households with and without disabled members is discussed, standard errors were calculated and the differences between groups were tested using the Kendall's Tau test.

4.1. MULTIDIMENSIONAL POVERTY IN FIVE LA COUNTRIES

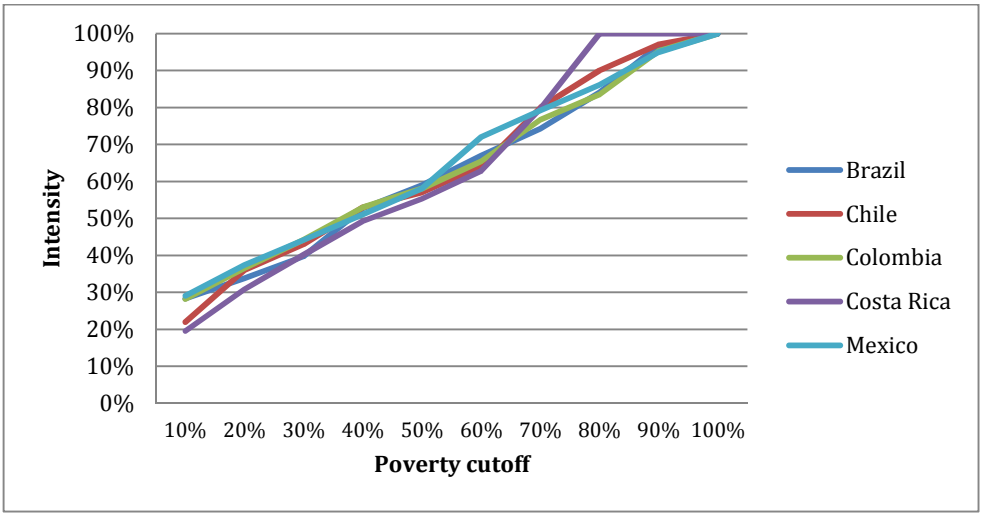
The percentage of individuals that were considered multidimensionally poor varied according to the poverty cutoff. Indeed, using a poverty cutoff equal to 10%, the percentage of poor individuals varies between countries, being the highest in Brazil (61%) and the lowest in Chile (21%). Brazil and Costa Rica were the countries with the highest headcounts when a union approach was used. In all countries, the headcount was zero when an intersection approach was implemented. Figure 9.1 shows the variation of the headcount in each country. Brazil had the higher level, when the poverty cutoff was below 40%, after this point there were no significant differences between the levels of poverty of Brazil and Mexico, and after 60% the headcounts of the five countries overlap.

FIGURE 9. 1. HEADCOUNT (H) MULTIDIMENSIONAL POVERTY 5 COUNTRIES



By contrast, the intensity of multidimensional poverty showed no significant differences between countries. Using a poverty cutoff equal to 10%, Costa Rica had the lowest levels of intensity. However, this country reached a 100% of intensity before all other countries (80% of poverty cutoff) (Figure 9.2).

FIGURE 9. 2. INTENSITY (A) MULTIDIMENSIONAL POVERTY 5 COUNTRIES



Brazil had the highest levels of the adjusted headcount, compared to other countries. Colombia and Mexico had similar levels of multidimensional poverty

and only after a poverty cutoff equal to the 70%, the poverty levels of Brazil, Mexico and Colombia got closer (Figure 9.3).

FIGURE 9. 3. ADJUSTED HEADCOUNT (M0) MULTIDIMENSIONAL POVERTY 5 COUNTRIES

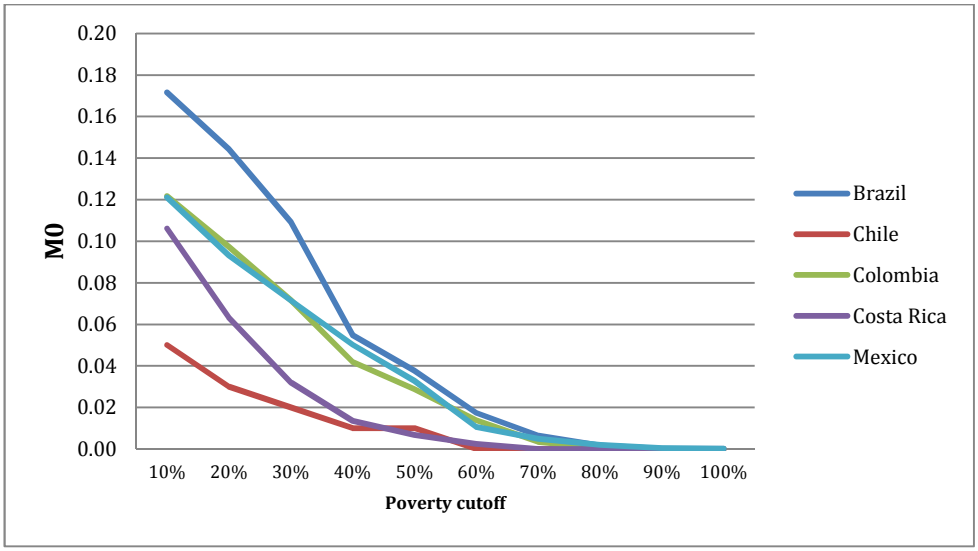


Table 9.6 presents a summary of the headcount (H), the intensity (A) and the adjusted headcount (M0) using a 34% poverty cutoff. In addition, the percentage of population considered as vulnerable to poverty is also included. As it was mentioned, the adjusted headcount was higher in Brazil and lower in Chile. The intensity of multidimensional poverty is similar in all countries, with the highest intensity (50.5%) in Mexico and the lowest (45.1 %) in Costa Rica. The percentage of vulnerable population followed similar tendencies to the multidimensional poverty rates. In fact, in countries with headcounts higher than 10%, the percentage of vulnerable individuals was also higher than 10%.

TABLE 9. 6. HEADCOUNT, INTENSITY AND ADJUSTED HEADCOUNT PER COUNTRY

Country	H (k=34%)	A (k=34%)	M0 (k=34%)	Vulnerable H
Brazil	14%	48.5%	0.069	27%
Chile	3%	48.1%	0.016	3.1%
Colombia	11%	48.4%	0.055	10.3%
Costa Rica	4.6%	45.1%	0.021	12.5%
Mexico	13%	50.5%	0.065	12.2%

The analysis of the levels of deprivation of poor households using a poverty cutoff equal to 34% revealed that each country had different levels of deprivation in each indicator. In the case of Brazil, Colombia and Mexico the indicator with the highest deprivation level was access to sanitation (toilet); other indicators related to the dimension of living standards such as access to water, electricity, material of walls or assets had different censored headcounts in each country. Colombia had the highest levels of deprivation in access to water and in the number of assets. Chile presented the lowest levels of deprivation in all the indicators, with the highest level in years of schooling. Child mortality was one of the indicators with the highest levels of deprivation in Brazil and Mexico. Nevertheless, Chile, Colombia and Costa Rica had a percentage of poor people deprived in this indicator close to 0%. Costa Rica was the only country that presented similar levels of deprivation in all the indicators, except child mortality (Figure 9.4).

FIGURE 9. 4.CENSORED HEADCOUNT PER INDICATOR PER COUNTRY

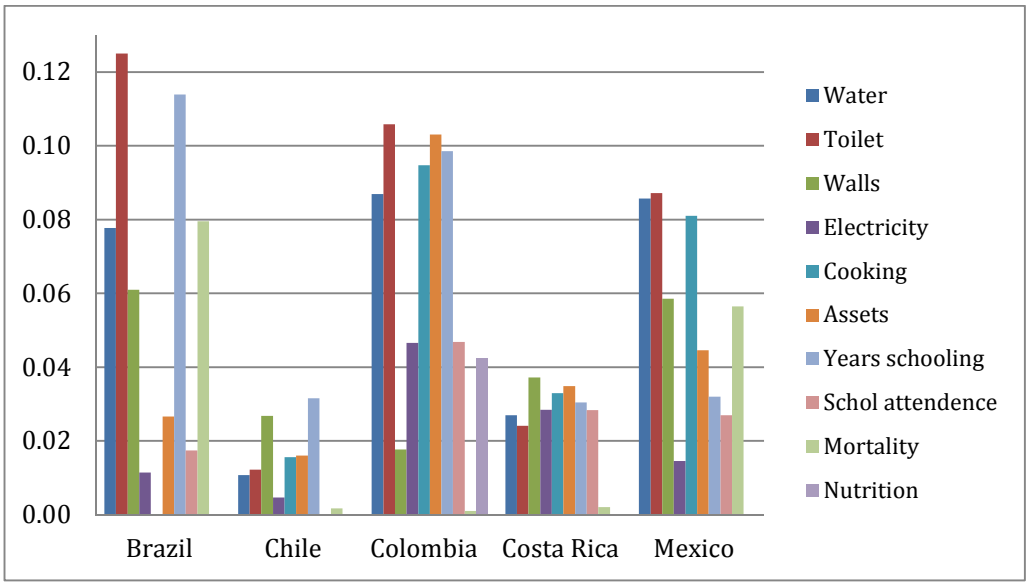


Figure 9.5 and 9.6 present the absolute and relative contribution of each indicator to the adjusted headcount. Each country presents a different distribution of indicators. In the cases of Brazil and Mexico, the indicator with the highest contribution was child mortality, it is important to highlight that this indicator had a contribution of 1/3 to the adjusted headcount in all countries except Colombia. In the case of Mexico this indicator contributes in more than 50% to M0, aspect that is related not only to the weight, but also to high levels of child mortality in the poorest regions of the county (see appendix 7 for details). Chile presented the lowest levels of multidimensional poverty, with years of schooling as the indicator with the major contribution, as in the case of child mortality, in this country schooling had a weight equal to 1/3, aspect that affects directly the contribution of it to M0. Malnutrition was included only in Colombia and it had a relevant contribution to the final adjusted headcount, with 12% contribution to M0.

FIGURE 9. 5. ABSOLUTE CONTRIBUTION INDICATORS MPI PER COUNTRY

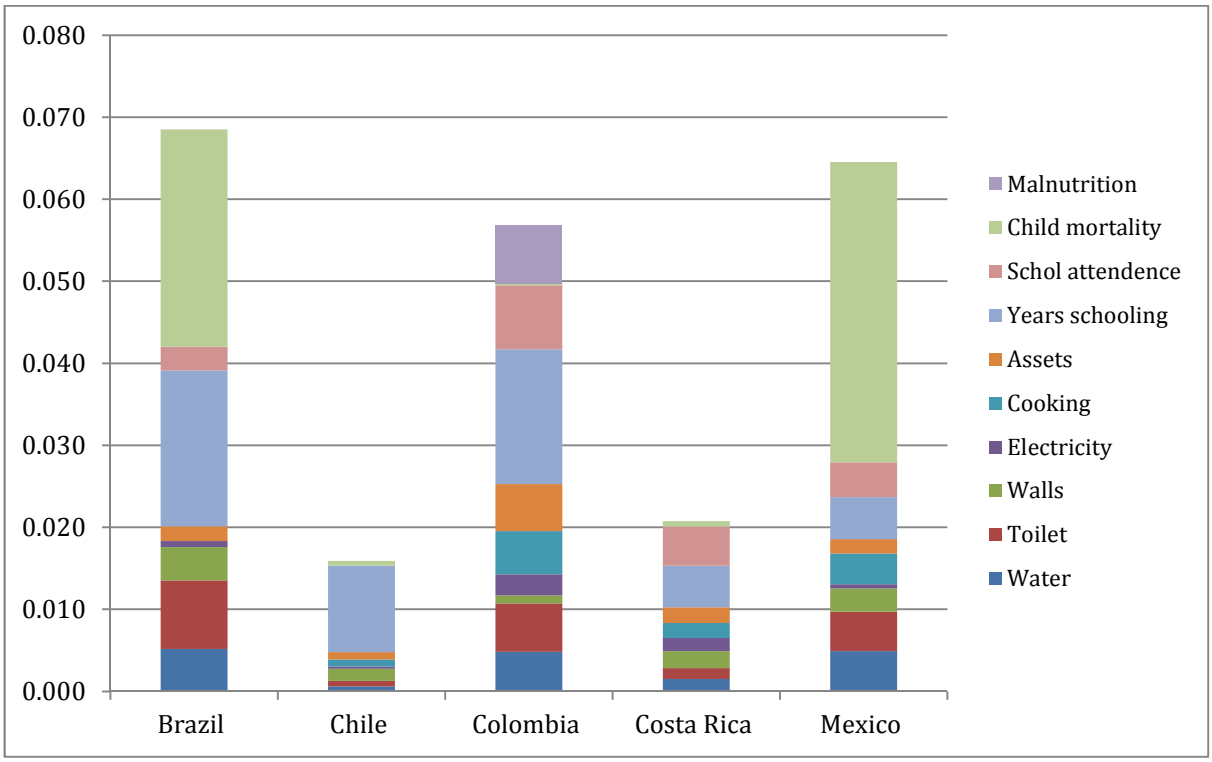
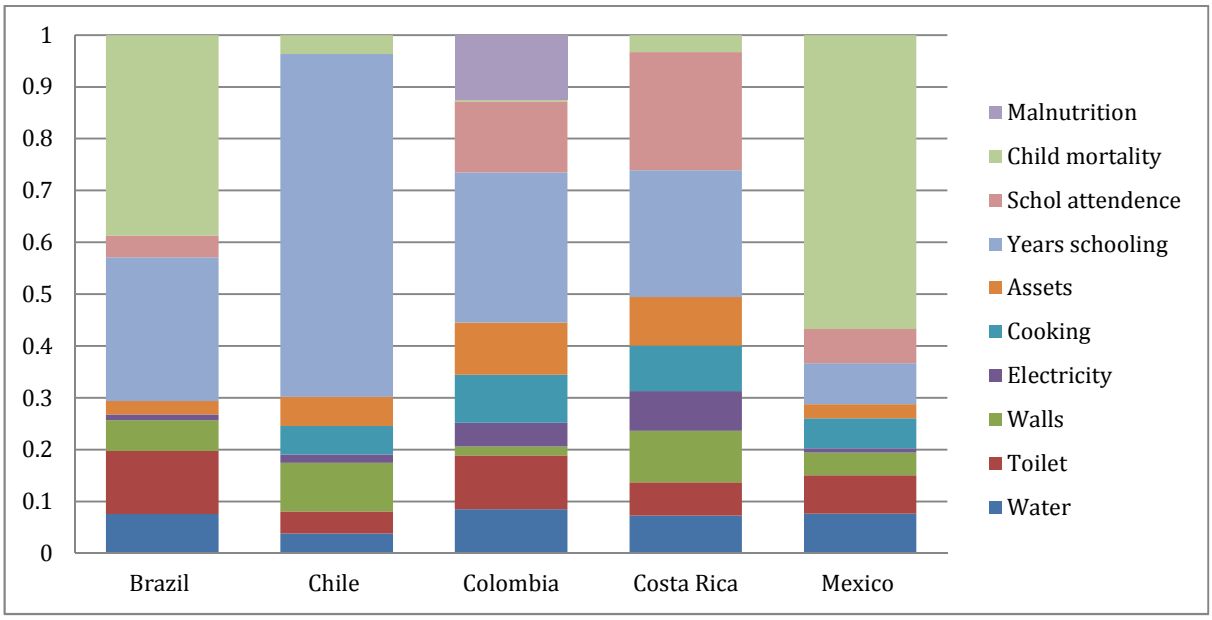


FIGURE 9. 6. RELATIVE CONTRIBUTIONS INDICATORS MPI PER COUNTRY



4.2. DISABILITY AND MULTIDIMENSIONAL POVERTY

The analysis of the levels of multidimensional poverty of households with and without disabled members revealed that in all countries the headcount and the

adjusted headcount were higher for households with members with a disability. In countries such as Mexico, the difference between headcounts was close to 10%. Costa Rica presented the lowest difference (2.9%) and even in Chile, the country with the lowest levels of multidimensional poverty, the difference was 4%.

The intensity of multidimensional poverty was lower for households with disabled members in Colombia and Costa Rica by less than 1%. Brazil was the country with the highest difference in the intensity levels of multidimensional poverty; in this case, households with disabled members had intensity 2.6% higher than households without disabled members. Mexico and Brazil were the countries with the highest adjusted headcount for households with disabled members. Contrasting to the national results, the disaggregated results revealed that although the levels of multidimensional poverty for households with disabled members are higher in the five countries, Costa Rica had the lowest levels of multidimensional poverty for households with disabled members (Figures 9.7 to 9.9).

FIGURE 9.7. HEADCOUNT MPI PER COUNTRY HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS

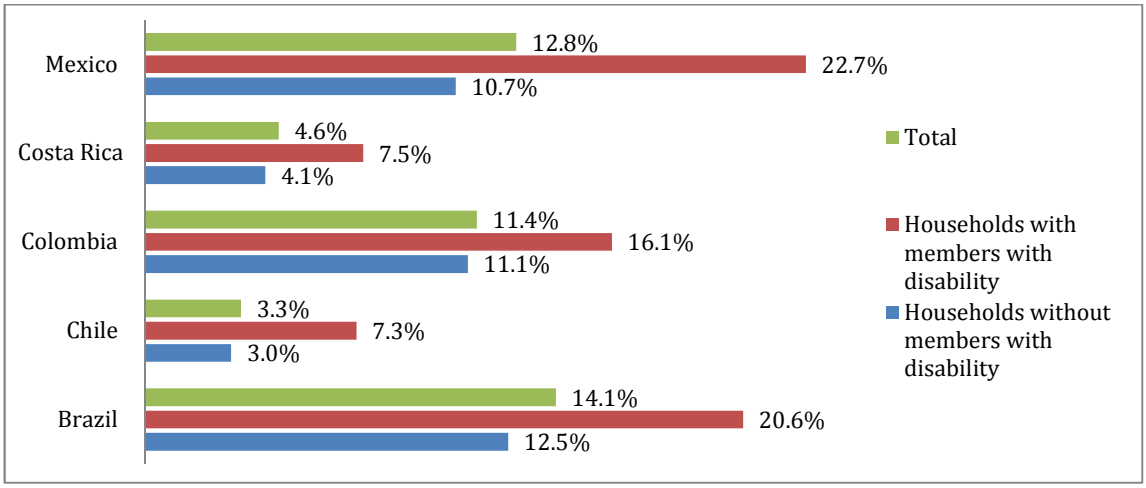


FIGURE 9.8. INTENSITY POVERTY MPI PER COUNTRY HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS

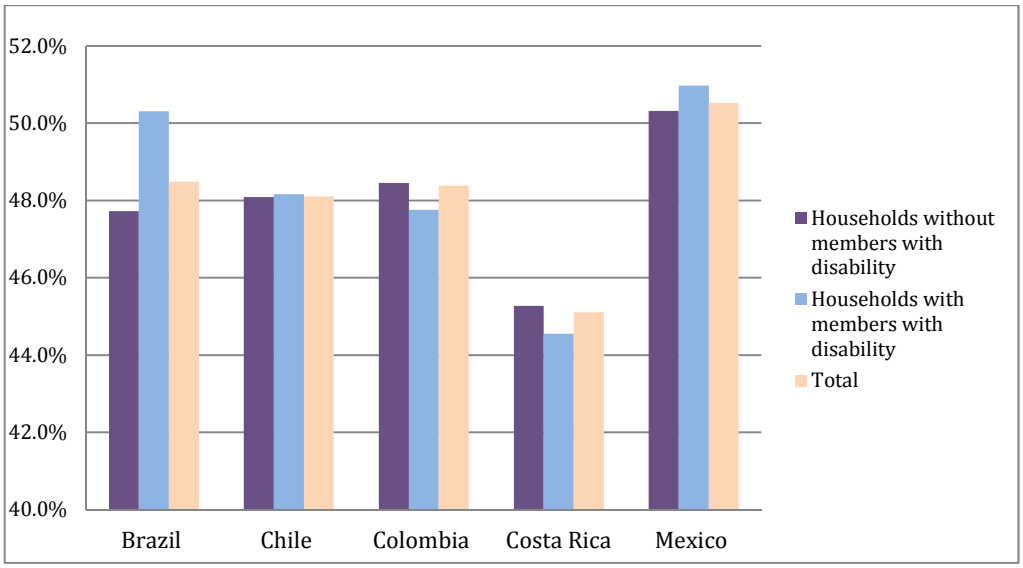
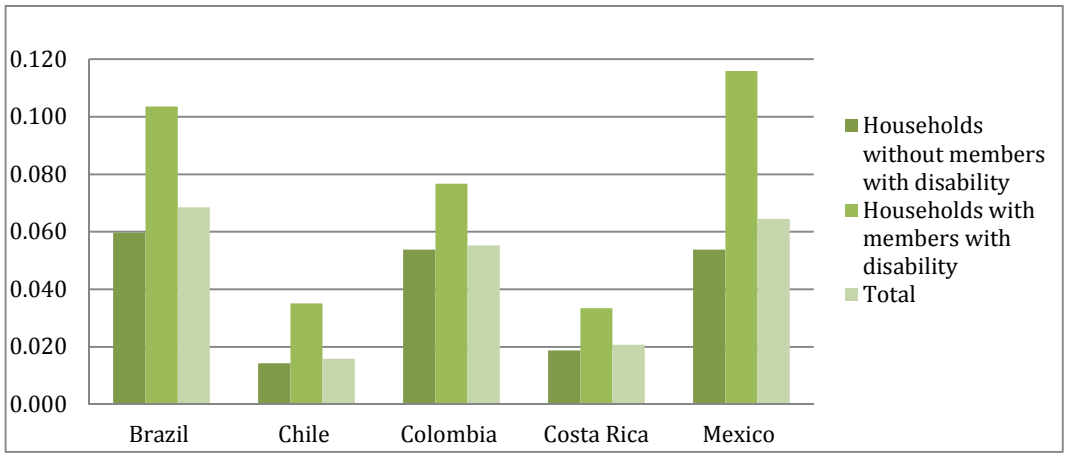


FIGURE 9.9. ADJUSTED HEADCOUNT MPI PER COUNTRY HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS

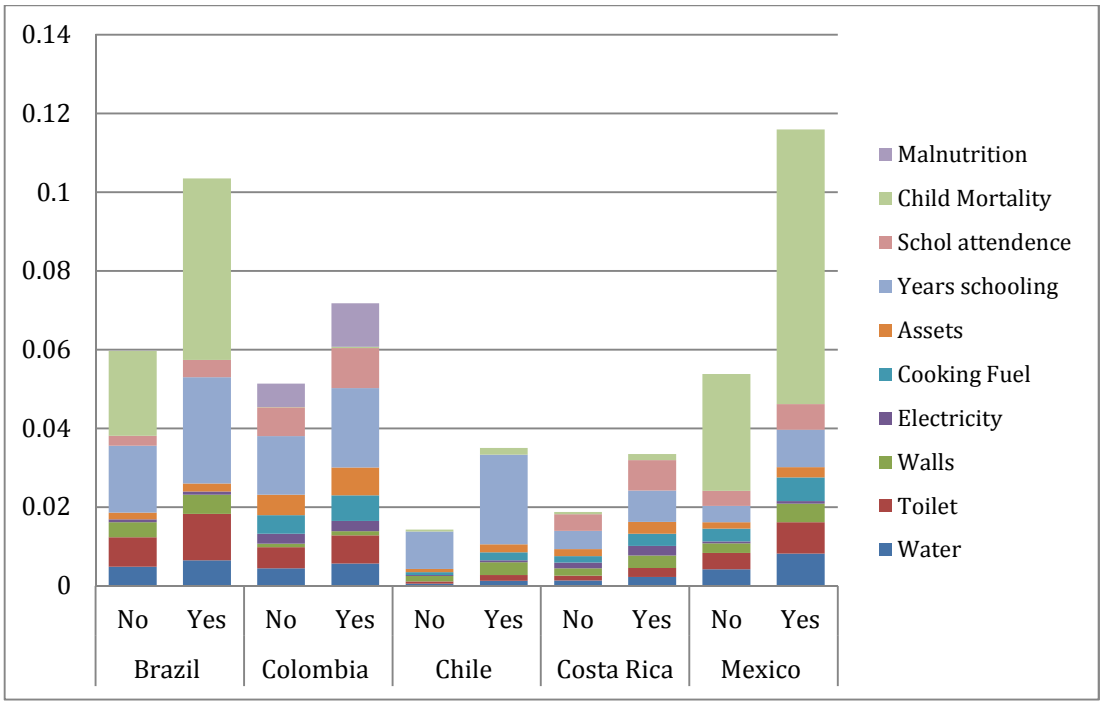


The comparative analysis of the censored headcounts for households with and without disabled members indicated that the deprivation levels in all dimensions were higher for households with disabled members. Deprivation in indicators such as child mortality, access to sanitation services and years of schooling were more important for households with disabled members.

In general, the contribution of indicators to the adjusted headcount presented a similar pattern in households with and without disabled members. However, the

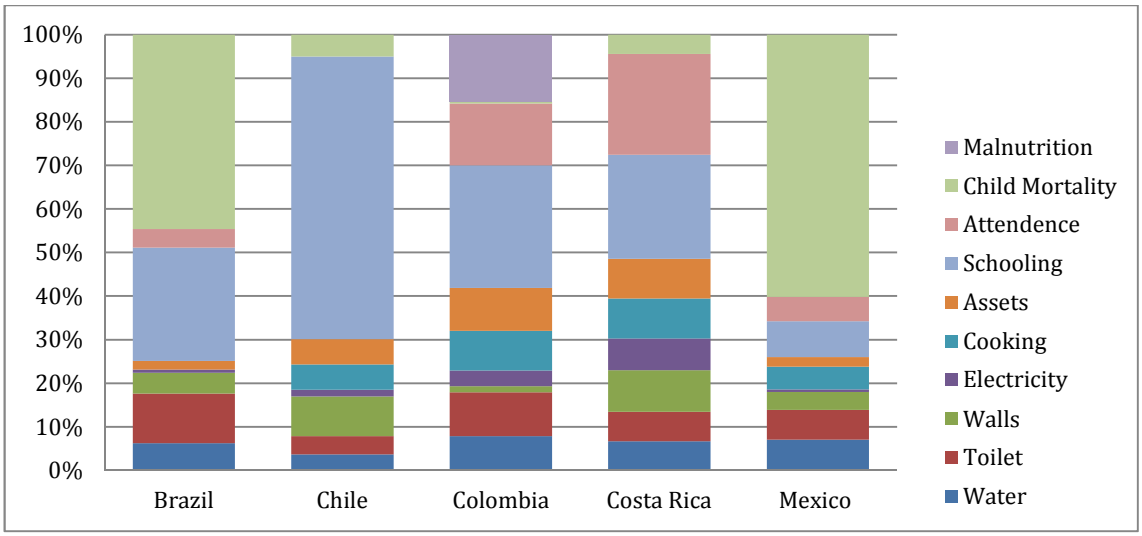
magnitude of each contribution was always significant higher for households with disabled members. In the case of Brazil and Mexico child mortality was the indicator that contributed the most for both types of households, with a contribution higher than 50% in Mexico, the main reasons for this are: 1. the weight that this indicator has in the index (1/3); 2. more than 80% of multidimensional poor households with disability are deprived in this indicator and 3. a large percentage of multidimensionally poor households live in the poorest regions of the country (Guerrero, Chiapas and Oaxaca) (see appendix 7 for details). Finally, in the case of Chile, year of schooling was the indicator with the higher contribution to M0 for households with disabled members in Chile[33] and Colombia (Figure 9.10 and 9.11).

FIGURE 9. 10. ABSOLUTE CONTRIBUTION INDICATORS MPI PER COUNTRY IN HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS



[33] In the case of Chile years of schooling has a weight equal to 1/3. Aiming to corroborate the results the index was calculated using different combinations of weights and indicators and indeed the results are similar in most cases (see appendix 7 for details).

FIGURE 9.11. RELATIVE CONTRIBUTION INDICATORS MPI PER COUNTRY IN HOUSEHOLDS WITH MEMBERS WITH DISABILITY



4.3. SUBGROUP CONTRIBUTION

The percentage of people living in households with at least one member with disabilities represented an important proportion of the poor population in each country. The contribution to the national adjusted headcount of these households was higher than 20% in four of the five countries. Only in Chile, the contribution of this group was 17%. The contribution of people living in households with disabled members to the national M0 was higher in Mexico and Brazil, with a contribution equal to 31% (Table 9.7). In the case of Mexico, it is important to highlight that the percentage of poor households with disabled members was lower but the intensity of multidimensional poverty was higher than 50%.

A detailed analysis of the contribution of households with disabled members to each indicator in each country is included in Appendix 7.

TABLE 9.1. PERCENTAGE OF HOUSEHOLDS WITH MEMBER WITH DISABILITY AND CONTRIBUTION OF THOSE TO NATIONAL M0

Country	Share of the population	Contribution
Brazil	20.2%	0.31
Chile	7.8%	0.17
Colombia	20.4%	0.27
Costa Rica	13.7%	0.22
Mexico	17.3%	0.31

5. DISCUSSION

Disability affects the individual and his/her family and increases their risk of income and multidimensional poverty. Nevertheless, the analysis of the relationship between disability and poverty has been limited by the short number of data sources that include questions on disability and capture the real prevalence of this condition. In recent decades, the role that disability plays on the levels of poverty of a country has become more important, especially after the declaration of the MDGs. People with disabilities were not mentioned or included in the MDGs, however after 2001 a higher number of official documents concerned with the reduction of poverty started to consider the need to include this population. Nevertheless, people with disabilities and their families are still not properly mentioned and included in programmes to reduce poverty in developing countries, factors that reduce their strategies to overcome poverty (Barnes and Sheldon, 2010, Barron and Ncube, 2010, Yeo, 2003, 2005, Yeo and Moore, 2003).

Different studies have analysed the relationship between disability and poverty (Barron and Ncube, 2010, Davila Quintana and Malo, 2012, Elwan, 1999, Filmer, 2008, Graham et al., 2012, Groce et al., 2011a, Daniel Lustig and Strauser, 2007, Mitra et al., 2011, Mitra et al., 2013b, Mont and Cuong, 2011, Pandey, 2012, Trani and Loeb, 2012) and describe in some detailed, the characteristics of people with

disabilities and their families. However, only one study (Mitra et al., 2013b) has analysed the levels of multidimensional poverty of people with disabilities around the globe, and two studies have included disabled children in their analysis (Trani et al., 2013, Trani and Cannings, 2013).

The levels of multidimensional poverty in LA countries differ between and within countries. Using basic indicators in health, education and living standards most countries in the region present low levels of multidimensional poverty. However, when different deprivation cutoffs were used, levels of deprivation of individuals and households in each country increased. Using the capability approach poverty is defined as a capability deprivation, meaning that of importance is not having a level of income, but the fact that a person has the freedom to live the life that s/he wants and values (Sen, 1999). In the case of disability, the capability approach can help to analyse how interactions between individuals and environmental characteristics, plus the level of available resources creates disability (Mitra, 2006). Under this approach a detailed analysis of how the levels of economic resources create the link between impairment and disability.

Disability has been analysed using the capability approach in different studies (Baylies, 2002, Burchardt, 2004, Dubois and Trani, 2009, Graham et al., 2012, Mitra, 2006, Mitra et al., 2013b, Terzi, 2004, 2005, Trani et al., 2011a, Trani and Loeb, 2012, Welch, 2002). In all cases, the main reason to use this approach was the need to understand deprivation not only as the lack of resources, but also as the result of difficulties to convert commodities into real functionings. This approach also helps to analyse how the nonexistence of practical and real opportunities reduces the level of freedom for people with disabilities and their

families, an aspect that has a negative effect on the options a person and his/her family can choose from (given the limited set of functionings that are available).

The global MPI aims to measure acute poverty and includes basic indicators related to access to services and to cover basic human needs. Health and education have been identified as dimensions for human development; indeed, life expectancy and literacy are instrumental capabilities that provide the means to acquire other important capabilities. People with disability have higher illiteracy rates, low levels of education and usually do not attend school (Filmer, 2008, WHO & WB, 2011). They also face attitudinal, environmental and economic barriers to access basic opportunities including health care services, aspects that negatively affect their life expectancy and quality of life (R. Thomas and Barnes, 2010).

In the five LA counties analysed, households with disabled members always had higher levels of multidimensional poverty, compared to households without disabled members. The results of this study indicate that the levels of deprivation of these households were higher, and even when a dimension did not have an important contribution to the national multidimensional poverty, it had a major contribution for those households. These findings reflect that people with disabilities and their families are in a worse condition that poor individuals without disability. The results from Mexico and Brazil[34] followed a similar tendency to the results presented by Mitra et al. (2013b). Both countries had higher headcounts, intensities and adjusted headcounts for households with disabled members.

[34] Chile, Colombia and Costa Rica were not included in the analysis conducted by Mitra et al. (2013)

The analysis per dimensions indicated that households with disabled members had higher levels of deprivation for indicators within the health dimension. Indeed, levels of deprivation of poor households (censored headcount) for the indicators in the health dimension were always higher, even in countries, whose national deprivation levels were close to zero in this indicator (Costa Rica, Colombia and Chile). Brazil and Mexico presented higher levels of deprivation for this indicator, and in the case of Mexico, the dimension of health had the highest contribution to the final MPI, this finding was similar to the one presented by the general MPI in 2010 (Oxford Poverty and Human Initiative (OPHI), 2013). This does not mean that Brazil and Mexico have high rates of child mortality, but that this situation is more prevalent in poor households. This analysis was corroborated, when the index was calculated by region and rural/urban areas. Metropolitan areas had lower (close to zero) contribution in this indicator. By contrast, poor regions had higher levels in this indicator (see appendix 7 for details).

Education is one important aspect of development. High levels of education give opportunities to obtain better paid jobs and it is also associated with access to information that facilitates social and economic participation. In the case of an individual household the level of education of its members becomes an important asset. Empirical evidence revealed that households whose members have higher levels of education, have lower levels of income poverty and less numbers of deprivations (Lipton and Ravallion, 2008). Moreover, high education of the head of the household is associated with lower levels of multidimensional poverty (Battiston et al., 2009) and as was found in chapter 8 low levels of income. For people with disabilities education is an important dimension of development.

Indeed, if individuals with impairments live in households where its members have high levels of education, the probability that the household becomes poor is lower.

The results of this study corroborate the hypothesis that households with disabled members have on average lower levels of education. In four of the five countries, years of schooling of members older than 12 years old had a high contribution to the multidimensional poverty. In Chile, this indicator had the highest contribution to the levels of multidimensional poverty and this contribution increased in households with disabled members. School attendance of children between 5 and 15 years had the highest contribution in Costa Rica. In this country, households with and without disabled members had higher levels of deprivation in this indicator. Additionally, when the relative contribution for households with disabled members was analysed the contribution was even higher. In Brazil and Mexico, this indicator did not have a high contribution. In cases where school attendance was not included in the calculation, the levels of multidimensional poverty increased, meaning that in countries such as Brazil, the major issue is not related to aspects such as access to education for children, but with the level of education of adults; similar results were found by Battiston et al. (2009).

The dimension of living standards included indicators that were directly related to household conditions, and indirectly to health. Access to a source of clean water and to adequate sanitation services are factors that reduce the risk of acquiring communicable diseases, which usually affect children and elderly populations. In this context, to have access to these services has become a priority in all developing countries. In three of the five countries (Brazil, Colombia and Mexico)

8% to 9% of the multidimensionally poor population did not have access to a source of clean water and in the case of Brazil (13%) and Colombia (11%) did not have access to sanitation services. In general, multidimensionally poor households with disabled members had 3% to 5% higher levels of deprivation in these indicators. In the case of Brazil and Mexico the levels of deprivation in access to sanitation were 9% and 7% higher for households with disabled members compared to households without disabled members.

Disability has become a global social phenomenon that affects individuals and their families. Direct, indirect and opportunity costs of disability have a negative effect on the available individual and household income and on the type of available opportunities for this group. Income or indirect measures of poverty do not fully capture the total effect of disability in a household (Kuklys, 2005), therefore the analysis of the relationship between disability and poverty should use direct and indirect measures of poverty.

In the case of multidimensional poverty in the five LA countries included in the analysis, it was found that the levels of multidimensional poverty of households with disabled members were always higher than for those households without disabled members. Moreover, deprivations in access to basic services such as a source of clean water and sanitation were more prevalent in those households. Child mortality and low levels of education of adults were also a constant deprivation for those households. All these results suggest that the levels of multiple deprivations of poor households with disabled members are higher, reflecting that disability is associated with multidimensional poverty in the five LA countries. Furthermore, the deprivation of households with disabled members

living in rural areas are always worse than for those in urban areas indicating that when a person faces different disadvantages, her/his levels of deprivation increase.

These results have important social policy implications. People with disabilities and their families are overrepresented in poor populations; they are deprived of different basic needs, increasing the risks of poverty and chronic poverty. In addition, social policies aiming to reduce or eliminate poverty (and extreme poverty) may explicitly include people with disabilities and their families, recognising their diversity and their different needs.

The results suggest that the levels of multidimensional poverty of households with disabled members are always higher than in other households. Indeed, in all the dimensions and indicators included, higher levels of deprivation were found for this group, meaning that, people living in households with disabled members are not only vulnerable but poorer than people living in households without disabled members. Access to basic services and opportunities that allow individuals and households to overcome poverty are usually closed to people with disabilities and their families, creating a vicious circle of poverty and disability and in the case of disabled and multidimensional poor individuals and households a poverty trap, reducing the access to basic being and doing that limits their capability expansion and therefore their freedom.

6. Conclusions

This chapter has analysed and compared the levels of multidimensional poverty of households with and without disabled members in five LA countries. It considered

similar dimensions to the ones included in the global MPI, but used higher dimension cutoffs in some indicators. The poverty cutoff was 34%, meaning that a household was considered multidimensionally poor, if it is deprived in one or more dimensions (or the equivalent in a number of indicators). Different alternative indices were calculated, using different indicators, weights and poverty cutoffs (see appendix 7 for details). The results were compared between countries and the levels of multidimensional poverty of households with members with disability were analysed in each country. In general, in the five countries the levels of multidimensional poverty for households with disabled members were higher than for those without. In addition, multidimensionally poor households with disabled members presented higher levels of deprivations in all indicators. In some cases, the percentage increase by double and in all cases the differences were significant.

The countries with the higher levels of multidimensional poverty for households with disabled members were Mexico and Brazil. The proportion of multidimensionally poor increased by 0.062 and 0.044 in the adjusted headcount, respectively. Additionally, the contribution of households with disability to the national multidimensional poverty was higher to 20% in four of the five countries (except Chile).

People with disabilities and their families face more and severe deprivations compared to non-disabled households. The level of multidimensional poverty and levels of deprivation in indicators related to health, education and living standards were always higher for this group. The analysis of poverty of people with disabilities and their families cannot be limited only to indirect measures such as

income or consumption. It is extremely important to include aspects related to deprivations of basic capabilities related to education and health. Dimensions such as labour and social participation have been identified by people with disabilities and their families as factors that affect their levels of poverty and social exclusion (Inclusion International and Inclusion Interamericana, 2004). Those dimensions are important in the analysis of multidimensional poverty for this group, and should not be forgotten. Unfortunately, data limitations are a huge issue for the analysis of multidimensional poverty and become even bigger, when the aim is to analyse the levels of multidimensional poverty of people with disabilities.

This study did not include information at the individual level. Aspects related to access to education or health care services for people with different types of impairments were not considered because of data limitations. It is acknowledged by the author, that this limits a more detailed analysis of the situation of disabled people in LA. When the household is selected as the level of analysis, it is not possible to analyse intra-households distribution of basic opportunities; exclusion from basic services or the role that different types of impairments play on the levels of deprivation of basic capabilities of people with disabilities. Nevertheless, the results of this study provided empirical evidence on the levels of multidimensional poverty of households with disabilities, and reveal that those households had a high contribution to the national poverty rate. This means that households with disabled members should not be left behind in development strategies.

CHAPTER 10

DISCUSSION: POLICY INTO PRACTICE

1. INTRODUCTION

Disability is a concept that has been defined using different perspectives and theoretical approaches. Currently, disability is understood as the result of an interaction between a health condition and social and environmental factors that act as barriers in the social inclusion of people with a disability (WHO, 2001). In LA, the understanding of disability has been closely aligned with the approach of the WHO and the UN. Indeed, after the declaration of the CRPD, changes have occurred in how countries define disability in their legislation. Of the countries researched in the present study, Mexico and Costa Rica are clear examples of countries which have enacted legislation based on a human rights perspective.

As discussed in chapters 3 and 4, disability is currently understood as a social phenomenon that affects the individual and his/her family and it is related to social exclusion processes. There is a lack of knowledge on how people with disabilities and their families become poor, and how poor individuals become disabled. The relationship between disability and poverty is mediated by the existence of social exclusion processes for poor and disabled people (see chapter 4 for details). Those processes are usually associated with restricted access to basic opportunities and social services, especially education and health. As a consequence, people with disabilities have low levels of human capital and poor individuals had low access to preventive and curative health care services.

The analysis of the relationship between disability and poverty has been limited by the existence of sufficient data. Indeed, there is no data that has allowed an in-depth analysis of causality between these two conditions. Currently, a longitudinal data source, which includes a globally accepted definition of disability and operationalizes the concept following the suggestions made by the WG, does not exist in LA. As a consequence of the lack of appropriate data and the lack of inclusion of disability questions, the study of this relationship has been limited to descriptive analysis and in most cases disability has not been analysed as a possible cause of poverty.

In LA there are no detailed studies of the causal mechanisms of this bidirectional relationship. Although the importance of guaranteeing and protecting human rights and equalizing opportunities for people with disabilities has been recognised; it is also clear that social policies and strategies to reduce poverty in developing countries usually do not properly include people with disabilities and their families as possible beneficiaries (Marriot and Gooding, 2007).

In order to provide empirical evidence on the relationship between disability and poverty in LA, this study tested the hypothesis *households with disabled members have a higher risk of poverty compared with households without people with disabilities*. Information from fifteen surveys was used and different measures of poverty (direct and indirect) were included as dependent variables. Although, the importance of analysing individuals' conditions was recognised, the household was selected as the level of analysis, making comparisons possible between years and within countries.

The results of this study indicate that households with disabled members have a higher probability of being classified as or considering themselves to be poor and of having lower levels of income and higher levels of multidimensional poverty. Whichever type of measure of poverty was included as the dependent variable it was found that in all cases (except Chile 2009 model 1) households with disabled members had a higher risk of income and multidimensional poverty (see chapters 8 and 9 for details).

The aim of this chapter is to discuss the implications of the existence of a relationship between disability and poverty in LA. Given the results of this research, disability can be considered a determinant of poverty and households with disabled members have a higher probability of becoming poor or chronically poor. Methodological implications of using secondary cross-sectional data in the study of disability and poverty are also discussed.

The chapter is divided in six sections including this introduction. In the second section the existence of a relationship between disability and poverty is questioned and the importance of recognising social exclusion as one major factor in this relationship is considered. The section that follows presents a short discussion about the importance of recognising disability as part of human diversity and proposes social policies based on theories of social justice that recognise human diversity as a norm not an exception. I then consider the difficulties of conducting comparative research in the field of disability. Followed by a discussion of the possibilities of necessity to advance in the analysis of the association between disability and poverty and increase the evidence in order to make causal claims on this topic. Finally the conclusions of this chapter are presented.

2. POVERTY, SOCIAL EXCLUSION AND DISABILITY: THREE RELATED CONCEPTS

The relationship between disability and poverty is bidirectional, meaning that people with disabilities have higher risks of becoming poor and poor individuals have higher risks of becoming ill and impaired. The extra costs of disability and the higher levels of social exclusion that this group face are some of the causes that increase the risk of poverty of people with disabilities. On the other hand, malnutrition, low access to preventive and curative health care services and high levels of violence are some of the reasons that increase the risk of illness of poor individuals. As has been presented by Yeo and Moore (2003), the bidirectional relationship is always mediated by the existence of social exclusion processes, which are associated with discrimination and social isolation of people with disabilities and their families (see chapter 4 for details).

Although the relationship between disability and poverty has been described as a two-way relationship, the important role that social exclusion plays in the increased risk of poverty or/and disability has been recognised. Indeed, the lack of access to basic opportunities, especially to education and health is the main factor that increases the vulnerability of both groups (poor and disabled).

The publication of the MDGs in 2001 raised awareness of poverty and the need to establish different mechanisms to overcome this situation and end extreme poverty. Meanwhile, it was also identified that people with disabilities and their families were the poorest of the poor (Elwan, 1999) and that disability affected individuals and households in developing and developed countries, with a major

effect on the levels of poverty and living standards of individuals in developing countries.

Although, disability was identified as a condition that increases the vulnerability to poverty of households around the world, the MDGs totally ignored and excluded this group. Indeed, it has been recognised that the MDGs will not be achieved given the exclusion of this population (UN, 2011). As a result of the increase in visibility of disability as a social problem, the post 2015 agenda has included this group as fundamental for the achievement of eradicating extreme poverty by 2030 (UN, 2013).

In conclusion, during the last 15 years, the awareness of the importance of disability and the socioeconomic conditions of this group has increased around the world. However, there is still a lack of knowledge concerning what the strongest direction is in the relationship between disability and poverty. The main cause of this unawareness has been the lack of available data on this topic. In addition, the definition and understanding of disability has changed in the last two decades and has moved to a human rights perspective. The post 2015 goals are based on this perspective and share important features with policies implemented to equalize opportunities for people with disabilities and their families. Social policies aiming to end discrimination, to guarantee a minimum of living standards and to provide equal opportunities to all individuals are fundamental to eradicate extreme poverty and to guarantee social inclusion of people with disabilities.

2.1. DISABILITY AND POVERTY: AN INVISIBLE CIRCLE

The evidence of the existence of a vicious circle between disability and poverty has increased in the last 15 years. Since the review published by the WB on the topic (Elwan, 1999), the number of studies conducted in order to analyse this relationship has increased. However, what is the most important direction of this relationship and which is the condition that affects the most (poverty or disability) has not yet been defined.

A lack of knowledge exists as to why households with disabilities in each country became poor and what mechanisms increase the risk of poverty for this population. In the literature one study was identified that used participatory methods and aimed to determine what dimensions affected the levels of poverty of households with disabled members in LA (Inclusion International and Inclusion Interamericana, 2004). Studies using longitudinal data or analysing the causal mechanism of this relationship were not found. The main consequence of the reduced number of studies on this topic in the region is the lack of visibility of people with disabilities in social policies and strategies to reduce and to eliminate poverty.

When poverty is understood not only as a lack of income; but also as a capability deprivation and a violation of human rights (Pogge, 2008), aspects such as freedom, equality and opportunities play a fundamental and vital role in the definition of who the poor are and why. In this context, disability becomes an important and relevant point in the analysis of poverty and it should be recognised that people with disabilities and their families have higher vulnerability to poverty. Nevertheless, disability is not synonymous with poverty therefore not all people

with disabilities are poor. Starting characteristics will always influence the final outcome. In other words, depending on individual and family levels of education, individual and household levels of income, type of occupation and the main role of the individual with disability in the family, the levels of vulnerability to poverty will increase or will not. Additionally, aspects related to severity, duration, type of impairment and access to technical aids and to vocational and rehabilitation will determine to some extent how independent an individual could be. This does not reduce the role that society plays in the construction of disability, but gives an insight into the importance that individual and family factors also have in the creation of disability.

Although disability has a direct effect on individuals, families are also negatively affected by this situation. In developing countries, the family has an important role in the provision of social services such as care (Fuligni et al., 1999). In LA, only a few countries have established non-contributory social pensions for people with disabilities. Additionally, only a few countries (e.g. Chile) have established complex programmes to reduce poverty that include specific benefits for people with disabilities (Cecchini and Madariaga, 2011). In cases where social protection systems have not established social assistance strategies for this group, they face higher risks of poverty and their family or close social network become the main support system.

Individual analyses of the relationship between disability and poverty demand a better and more complex data source. Indeed, although direct measures of poverty are included, the selection of dimensions and indicators is limited by the existence of data. In cases where indirect measures of poverty are included, it is difficult to

define and to analyse intra-household inequalities in the distribution of consumption without the appropriate data. In addition, the analysis of this relationship demands detailed information on indirect, direct and opportunity costs of each impairment. Aspects such as severity and duration of disability become fundamental to determine how disability can affect and change the way families distribute their resources and prioritise access to education or health care services of family members.

Disability and poverty interact as two conditions that are associated with stigma, oppression and discrimination. These three aspects enable the existence of social exclusion processes and reduce the number of opportunities that people with disabilities and poor individuals have access to. Therefore, the risk of becoming disabled increases when poor individuals are excluded from health care and education services, aspects that reduce their levels of information and increase the risk of becoming disabled. On the other hand, disabled people are excluded from education, labour, health, participation and other opportunities, reducing their chances of having the levels of life they want and they will enjoy and increasing their risks of poverty.

People with disabilities should be included in development policies, aiming to reduce their levels of poverty and increase their levels of human and social capital. This group cannot be ignored in any development agenda, given that it is impossible to reduce poverty or reach equity of opportunities and social development if 15% of the population around the world is invisible and excluded. Policies to reduce poverty should consider the needs, the extra costs and the high levels of social exclusion of people with disabilities and their families. Policies

should not segregate disabled individuals into special groups that need to be helped. Indeed, policies should aim to integrate people with disabilities and their families into the society, aiming to provide equal access to basic opportunities such as health, labour and education; to reduce discrimination and to increase general awareness of disability.

As a consequence of the high levels of poverty in households with disabled members, it is important that policies and programmes aiming to reduce poverty and importantly increase human capital levels of individuals include people with disabilities. However, this should not be done understanding disabled people as a homogeneous group, with similar needs and aspirations. It becomes extremely important to recognise the diversity of this population and explore policies that aim to increase the capabilities of each individual, giving them the freedom to choose what they want to do and to be.

2.2. Latin America: Is there an Association between disability and poverty?

In LA, studies analysing the relationship between disability and poverty are scarce. Only a few studies have analysed the economic effects of disability or the relationship between disability and poverty (Contreras et al., 2006, Cruz and Hernández, 2008, del Poso-González et al., 2008, Herazo-Beltrán and Domínguez-Anaya, 2013, Hernández and Hernández, 2005, Vargas-Calvo, 2001, Yrigoyen, 2013). The evidence on this topic is limited by the type and the quality of existing data. In fact, only until the 1990s a small number of national surveys included questions on disability, that usually asked "*Are you disabled?*" and ignored aspects related to severity or type of impairment. Only at the beginning of the 2000s, the

number of sources of information increased and a larger number of questions were included.

Before 2001, questions included in national surveys or censuses did not capture the magnitude of disability and underestimated the prevalence of different types of impairments. After this year, most LA countries moved to define disability as the WHO suggested in the ICF. Currently, disability is understood as the result of an interaction between a health condition and social and environmental barriers, based on this definition the WG proposed a short set of questions to include in national censuses or surveys (see chapter 3 for details). Using this set of questions, most LA countries have collected information on disability in their censuses and national household surveys. Nevertheless, in some cases information was collected at the household level and aspects related to severity were ignored.

As was explored in chapter 6, the five countries analysed in this study have included questions on disability in their national censuses and some of them, in national household surveys. As a consequence, awareness and knowledge of disability in each country has increased in recent decades. Indeed all LA countries included in this study have established national legislation on disability and have recognised the importance of protecting and guaranteeing human rights of this population. However, there is still a lack of recognition of the risk of poverty people with disabilities and their families face. In all countries (included in this study), people with disabilities are not explicitly mentioned in the social assistance programmes. In countries, where non-contributory pensions exist, the conditions to obtain these pensions depend on their working capability loss, their levels of

poverty and the non-participation in the labour market, and aspects related to high levels of indirect and direct costs are ignored (Pinilla-Roncancio, 2015).

It is crucial to understand the role that access to the labour market plays in the definition of who is or is not disabled in LA. The administrative definition of disability depends on the levels of work capability loss that a person has. In most cases, the role that social or environmental factors play in the construction of disability is not recognised as a fundamental factor. This becomes vital, when the relationship between disability and poverty is analysed, because in order to obtain a non-contributory subsidy the person should not be able to work (be classified as disabled by a medical board) and should live with less than a minimum threshold. Both conditions (being disabled and poor) start to play a role in how disability is associated with poverty and how the fact of living with impairments increases the probability of being poor, because of barriers imposed in access to labour markets and the extra costs of disability.

In general, being unable to work and being poor are two main requirements to obtain a non-contributory pension. Nevertheless, those who are disabled but want to work or are not "poor" are excluded from these types of benefits. At some point, these types of strategies to reduce income poverty of people with disabilities and their families help to prolong the exclusion of this group. Additionally, these strategies do not cover the extra costs associated with different types of impairments, aspects that have been recognised as a source of risk to poverty faced by people with disabilities and their families (Cullinan et al., 2011, Tibble, 2005a, Zaidi and Burchardt, 2005).

According to the results of this study, there is a positive association between disability and poverty in the five LA countries. Different types of measures of poverty (direct and indirect) were used as dependent variables and an analysis of how much the probability of being poor increased for households with disabled members was conducted. In all cases, households with at least one member with disability had a higher probability of being classified as poor or have a lower monthly household income.

In the cases of Brazil and Chile, the evidence suggested that poor households (according to the asset index) with disabled members had a higher income. One possible explanation to the positive effect of the variable poor household with disabled members can be the existence of non-contributory pensions, or other type of benefits designed to reduce or to prevent poverty in people with disabilities. Given that it was not possible to discriminate the effect of those transfers on each member of the household (with or without disability), it can be assumed that the income received by a person with disabilities was included as part of the family income (Medeiros et al., 2006), therefore household income increased.

In Brazil, Colombia, Costa Rica and Mexico the effect of the variables related to disability was always as expected, no matter the type of measure of poverty included as dependent variable (objective or subjective). There were small differences in the magnitude of the effect of the variables *presence of at least one member with disability* and *head of the household with disability*. Nevertheless, the existence of a member with disability increased the probability of being classified as poor or considered themselves as poor compared to households without disabled members.

Based on the results of both analyses, disability has a negative and significant effect on the levels of income and multidimensional poverty of LA households. Indeed, the cross-sectional analysis (chapter 8) revealed that in each country and year, around 20% of households had at least one member with disability. If added to this the low levels of education of this group (less than primary school) are considered and the high rates of unemployment of disabled people, it can be concluded that disability affects more than 20% of the population of five LA countries. In addition, disability becomes a social problem, when socioeconomic conditions of this group are related to social exclusion, low levels of human capital and lack of social and political participation. These results are corroborated by the analysis of the levels of multidimensional poverty of households with disabled members in the five LA countries, where these households have higher levels of deprivation in the three dimensions included (health, education and living standards), with child mortality and years of schooling as the indicators with the highest levels of deprivation (chapter 9 and appendix 7).

The household was selected as the level of analysis in this study. Nevertheless, this level ignored important individual aspects. Indeed, it was not possible to know what individual conditions of people living with different impairments in a household were; what was their family role (e.g. head, spouse or children) and how their individual characteristics (level of education and participation) differed with those of other members of the family. All these are vital points in the analysis of how disability as a social problem affects individuals and the type and the number of available practical opportunities.

The role that individuals with a disability play in a household should be also recognised. Given the level of the analysis used in this study, only a variable related to individual role of a person with disability was included. The variable *head of household with disability* was included in order to capture how the fact that the head of household was disabled affected the final levels of poverty of a household. In all cases, the results showed that this variable had a positive effect on the probability of being classified or considered as poor and the level of income of households with heads with disability were lower compared to households without disabled heads.

It is questionable what individuals consider and understand by "*head of the household*". The person who plays this role might be affected by the existence of a disability. This aspect is extremely important for the analysis of the relationship between disability and poverty. However, it was not possible to capture what the different understandings of this role were and if it changes when a person had disability. Given that cross-sectional data was used as source of information, it was not possible to analyse if the role of an individual changed as a result of acquiring impairments. It also was not possible to examine the effect of an increase in the severity of the impairment and how attitudinal and/or social barriers to participate and be economically active affected the role of a disabled member in a family.

The results of this study provide evidence that disability increases the probability of poverty of households in LA. These results also revealed that disability cannot be considered a minor problem; in fact around 20% of individuals in each country

were living in households with at least one member with disability and contribute to more than 20% of the national multidimensional poverty rate.

It is important to recognise that the information analysed in this study, only captures poor households with disabled members, but ignores poor disabled individuals within non-poor households. It was not possible to discuss equity of access to basic opportunities such as health or education for individuals with disabilities. However, it is possible to conclude that disability has a major effect on the levels of income, subjective, consumption and multidimensional poverty of households around LA. This situation has not changed in the last decade and in countries such as Colombia and Mexico the situation has become worse.

The findings also provide a general perspective of the need to include people with disabilities and their families in development and poverty reduction strategies. Those strategies should be based on a human rights perspective, where objectives related to increase social inclusion and equity of opportunities and to eliminate discrimination are the rule rather than the exception. The five countries included in this study have social assistance programmes to prevent, mitigate or overcome the risk of poverty. Although, those programmes have become more popular and have increased their coverage in the last two decades; there is not enough information to determine how people with disabilities are included and how families with disabled individuals fulfil the requirements of those programmes. This means that in most cases, this group has been ignored in developing and poverty reduction strategies.

In conclusion, the results presented in this study support and confirm the hypothesis that people with disabilities and their families have higher probability

of being poor. These results also revealed the importance of including disability as a determinant of poverty in the poverty profile of each country. Indeed, this condition in some cases might have a higher effect than other characteristics, for example age of head of household or number of elderly individuals in a household. The findings also suggest the need to conduct a detailed analysis of the effect (positive or negative) that CCTs might have on the levels of poverty of households and individuals with disability. Brazil and Chile are two examples of countries where non-contributory pensions exist, but are subject to not participating in the labour market and being poor. This ignores the fact that people with disabilities can participate in the labour market, but need extra resources in order to cover the extra costs associated with each type of impairment. Finally, the results give evidence of the need to explicitly include this group in development strategies. Social policies aiming to reduce poverty, to increase human and social capital, to equalize opportunities and to guarantee human rights for all individuals should include people with disabilities and their families.

3. JUSTICE AND DISABILITY

When disability is analysed as a social issue, which increases the risk of poverty for individuals and households, it cannot be understood as an individual problem, defined using a normality base line. Indeed, the role of the society should be recognised, without forgetting diversity of skills and basic endowments of each person. Those aspects influence an individual's decision to participate in a society (or not) and how individuals convert resources into capabilities.

Poverty is an unjust situation that should be prevented. Different social mechanisms and strategies ought to be available in order to provide protection to individuals and households vulnerable to poverty, including people with disabilities and their families. In addition, access to basic opportunities, especially those that increase human and social capitals of individuals should explicitly include people with disabilities.

When social policies and programmes are implemented to reduce and prevent poverty, people with a disability can be seen as subjects or objects. If strategies aim only to transfer resources (income), but not to increase their access to social opportunities or to reduce attitudinal and social barriers, people with disabilities are seen as objects of charity and not as agents of their own development. On the other hand, when social policies are based on a human rights or a capability approach perspective, increasing social and human capitals and guaranteeing human rights of people with disabilities becomes a priority and this group is seen as subjects of rights (Quinn et al., 2002).

In the context of social justice, disability should be understood as part of human diversity and not as an individual tragedy. In addition, all policies, strategies and programmes aiming to equalize opportunities, to protect and guarantee human rights and to reduce discrimination might understand that this group should not be considered as part of the "deserving poor" but as active members of a society. Welfare policies that aim to transfer social income to disabled individuals, based on a qualification/quantification of the level of disability and subject to inability to participate in the labour market; usually look to compensate individuals for their "disadvantages". Moreover, income transfers are provided in order to cover the

lack of labour income and not to equalize opportunities or to cover the extra costs of disability.

Even though different theories of justice can be found in the literature, most theories lack a proper understanding of disability. It is not an aim of this research to revise or to discuss those theories, but to consider that currently the Capability Approach presents an alternative to understand social justice including people with disability as active actors of the society and subject of rights and not as a group relying on state help or charity (Brighouse and Robeyns, 2010, Nussbaum, 2006, Sen, 2009, Terzi, 2005). Under this perspective, justice requires that all members in a society reach a minimum of certain capabilities and assuring their full role as citizens (Kaufman, 2006).

Finally, it is important to recognise that disability and especially dependency is a condition of life. All individuals at one point are relying on others in order to meet their basic needs. Childhood and elderly years are two examples of this, but this does not mean that people in their youth or even of mid-adulthood ages will not face situations of extreme dependency. Therefore, disability and dependency cannot be understood as unique situations, faced by a small percentage of the population; indeed, they should be recognised as a common situation in human life that can happen to anyone.

In conclusion, in order to talk about justice for people with disability, we need to forget about normality lines for human beings. It is vital to recognise the role of diversity and accept that all individuals in a society are different. Justice should not be based on perceptions of normality and social contracts that by default exclude groups with diverse needs. It should aim to provide a minimum of capabilities,

freedoms and opportunities in order that each individual can reach the life they want to live.

3.1. WHY WE SHOULD CARE ABOUT DISABILITY AND POOR DISABLED HOUSEHOLDS IN LA?

It is a reality that disability is associated with poverty. Although we cannot define the direction of this relationship and we cannot determine what condition is more important or influential, there is empirical evidence to support that people with disabilities are poor and that strategies to reduce poverty have not properly included this group.

People with disabilities should be recognised as subjects of rights and not objects of charity. If a society aims to guarantee human rights, to eliminate discrimination and to provide a minimum level of capabilities to all its members, this society needs to see disability as part of human diversity. In this context, social practices and institutions play a major role in how disability is understood and perceived. In other words, in order to reach equality and social justice in a society, negative perceptions against this group should be eliminated and diversity ought to be considered the rule and not the exception. How disability is understood continues to play a major role in how social policies are or are not considered as just. Indeed, when people with a disability are contemplated as part of a society, with the same rights and duties, a theory of justice should aim to guarantee a basic minimum to all citizens, regards what role is expected from them.

The five LA countries included in this study have legislation on disability, whose main objective is to guarantee human rights or equality of opportunities for people with disabilities. Mexico and Chile have anti-discrimination legislation that

includes a specific section for people with disabilities. In addition, Mexico and Costa Rica have included a human rights approach in their latest legislation on disability and have implemented strategic changes in order to unify the understanding of disability in the legislation. Finally, Colombia and Brazil have based their legislations on this topic on principles of equity and have proposed strategies to provide equal access to opportunities for this population. In general, the five countries have the relevant legislation to protect and to guarantee the rights of people with disabilities, but in most cases, there is a lack of implementation of those. Descriptive statistics reveal that people with disabilities have low access to education, high rates of unemployment, low access to health care (although they demand more services) and they have low levels of social and political participation, aspects that reveal that even if social polies exist, they are not completely successful.

Social policies aiming to equalize opportunities; to guarantee human rights and to reduce discrimination for people with disabilities in LA should be based on a perspective of social justice that understands the diversity of human beings. In addition, strategies to reduce poverty should explicitly include people with disabilities and their families, recognising that they are not a homogeneous group and that diversity is a basic human characteristic. Income transfers cannot be the only strategy to reduce poverty; in order to guarantee social justice. It is also important to provide access to all basic opportunities; including health, education and labour, with equal conditions and to guarantee the freedom to choose the live those with disabilities value to life. This does not mean forgetting the role that individuals and families play in the creation and use of available opportunities. It is

also individuals' responsibility to decide what they want and need, without feeling that those decisions will affect negatively their socioeconomic status.

In conclusion, people with disabilities in LA are an important and representative group of the population. This group is excluded from basic social opportunities, this has negative consequences on their levels of social and human capital and reduces their freedom to participate and be active members of a society. Legislation on disability and public policies in this topic ought to be based on a social justice perspective that recognises human diversity and does not use equalization mechanisms derived from "normality" assumptions about what individuals are expected to do in a society. The five countries included in this analysis have proposed legislation on this topic based on a human rights or an equality of opportunities perspective. Nevertheless, this does not assure that people with disabilities are seen as subjects of rights and not objects of charity.

4. COMPARING THE INCOMPARABLE?

Studies on disability have been limited by data availability, type of questions, level at which the questions were asked and cross-country comparability. As was discussed in chapter 3, there is a lack of sources of secondary data including questions on disability. Additionally, most cases include questions asking directly about disability and only a small percentage of the population with impairment consider themselves as disabled. Moreover, the objective of the survey usually determines the level where different questions are asked. Indeed, large household surveys ask disability questions at the household level, aiming to reduce time and economic costs of asking six questions (in the case of the short set questionnaire

proposed by the WG) to each household member. As presented in this study different questions on disability were included in each of the surveys, in the case of Colombia and Mexico questions were asked at the household level, and when the analysis was conducted, evident differences were found when the questions were asked at the individual or household level (see table 7.5). Additionally, the lack of cross-country comparability also limits the type of studies conducted on disability. If countries do not include the same question in their national surveys or the question included was not tested in different cultural settings, the results will not be comparable between countries.

In order to capture the complexity of disability, a large set of questions should be asked to all members of a household. This aspect increases costs and makes it difficult to collect information from a representative sample of the population. In addition, if the information is going to be used to compare the living standards of individuals and households with and without disability more detailed information should be gathered and the sample size ought to be larger.

For this study, it was important to analyse data from the general population, given that the objective was to study if the levels of poverty or the probability of being poor was higher for households with disabled members. Secondary data sources, which were representative at the national and regional level in each country, were used as source of information. As was discussed in the chapter on methodology, the main limitation of using secondary data is related to the operationalization of concepts and the fact that in most cases questions do not respond to the theoretical background used by the researcher. In the case of disability, this

becomes an important issue that affects the comparability of the results and limits the conclusions that can be reached in the analysis.

When complex concepts such as disability are operationalized, it should be recognised that, in the process of selecting questions, indicators and variables, valuable information is lost. As was discussed in chapter 3, disability has different models and theoretical understandings which are influenced by social, cultural and political circumstances. All these characteristics create difficulties in the process of narrowing a complex and multidimensional concept to specific indicators (Altman, 2001a).

Acknowledging the limitations of using secondary data and the complexity of analysing questions on disability an analysis based on Giovanni Sartori (1991) was proposed. Three different layers of operationalized disability concepts were established according to the number of attributes included in each question (see chapter 6 for details).

Given the two types of design used in this research, the results of the cross-sectional analysis might be generalised to LA as a region and the result of the analysis using Census data are comparable between countries. The aim of the cross-sectional analysis was not to make explicit comparisons on the levels of poverty of people with disabilities between countries. Data limitations and data characteristics were recognised since the beginning by the researcher. It was also acknowledged that making specific comparisons would provide inaccurate results and conclusions. However, given the research design and how cases were selected, it was possible to generalise the tendency of the results to the region (acknowledging differences between countries and levels of development of other

LA countries that were not included in the sample). On the other hand, when census data was used as source of information and the same index of multidimensional poverty was calculated (with the same indicators, weights and cutoffs), it was possible to compare the results of the analysis of multidimensional poverty, considering the limitations of the information.

The household was selected as the level of analysis. This reduced the effect of severity and type of impairment on the levels of poverty of households with disabled members. Indeed, given that the analysis included the variable presence of at least one member with disability in a household, the complexity of the information was reduced to a simple indicator. This had advantages for comparability between years, but important information for the analysis was lost.

In conclusion, as a consequence of the existence of different types of definitions and theoretical models to understand disability, the operationalization process becomes difficult. For this study, given the limitations on the data and the lack of comparability of data sources, a three layer conceptual analysis was implemented. Disability was operationalized in three layers depending on the number of attributes and characteristics included in the question. Although the fact that the household was used as the level of analysis aiming to increase comparability, it is recognised that aspects related to severity and type of impairment play a significant role. Those should be included in future research, aiming to analyse how different levels of severity and types of impairment generate changes in levels of poverty using direct and indirect measures.

5. From association to causality in disability studies

The relationship between disability and poverty has been described as cyclical, where both conditions (disability and poverty) play a fundamental role in the creation of the other. Indeed, as discussed in chapter 4, people with impairments face higher risks of poverty as a result of high direct, indirect and opportunity costs, social exclusion from basic opportunities and services and social discrimination. On the other hand, poor individuals face higher risks of illness and trauma; added to this, the lack of access to adequate medical services (preventive and curative services) increases the risk that a common illness becomes an impairment and leads to disability.

Although, in the last 15 years empirical evidence has increased on the topic, it is still largely anecdotal evidence that supports the existence of this cyclical relationship. In order to correctly analyse and to determine what the strongest direction is and what the causal mechanisms are, longitudinal data sources including information on disability and poverty should be collected, using the same question in each period of collection. Nevertheless, longitudinal data does not completely allow for an analysis of causal mechanism, given that is not possible to control all sources that affect (negative or positive) the levels of poverty of a household with disabled members.

The analysis and study of this relationship cannot be completely limited by the existence of data sources with the desired characteristics. It is vital to analyse the available information on the topic and to determine what the socioeconomic characteristics of people with disabilities are, their levels of social and political

participation and their levels of living standards and quality of life. All this information is necessary in aiming to propose social policies and other strategies to guarantee and to protect the human rights of people with disabilities.

The problem of double causality has been studied in the analysis of health and poverty (Ettner, 1996, Godlonton and Keswell, 2005, Sala-I-Martin, 2002, 2005). However, there has not been a detailed analysis of the double causality between disability and poverty. This study analysed the association between this two conditions, and as was discussed in Chapter 6, problems of endogeneity were acknowledged and the main method to manage these was to correct by bias inference, assuming that the magnitude of the coefficients will be higher than the results of the econometric analysis (see chapter 6, section 5.5. for details). Aspects related to level of education, participation in the labour market and access to health care services are directly related to disability. In this study, level of education of the head of the household and head of the household working were included as control variables. In addition, head of household with disability was also included. These three variables are associated with each other. The levels of education of the head of household are influenced by the existence of a disability and when it started. As was discussed in chapter 4, the age of the person when s/he acquired the disability has an effect on access to education and labour, therefore on his/her levels of education and labour participation. As a consequence, if problems of endogenity did not exist in the model, it will be expected that the pure effect of the variable disability on the levels of poverty of households with disabled members will be higher than the actual results.

Given data limitations, it has not been possible to make detailed analysis of causal effects and direction of the relationship between disability and poverty. Nevertheless, Cox (2012) proposed three versions of causality that allow to some extent to suggest causal mechanisms between disability and poverty, when observational data is used. The first version is given by the analysis of the results from multiple regression analysis that shows a relationship between a dependent and several independent variables. The second version is when an intervention is implemented and it is possible to treat variables as possibly causal effects. Finally, the third version is when different sources of evidence exist and a deep knowledge and understanding of the underlying processes of a causal relationship also are present. Version one is the most flexible and evidence at this level is easier to obtain, however, conclusions only using this type of causality cannot prove what the causal mechanisms are, if the causal process exists under different circumstances or if the effect is the result of the cause that is analysed.

Evidence based on observational data (cross-sectional) can provide information to support the existence of an association between disability and poverty. This study tested the hypothesis *households with disabled members have a higher risk of poverty compared with households without disabled members*, and using the first version of causality proposed by Cox, different regressions were estimated and a large number of control variables were included in the models. Although, the results are limited given the available data and the existence of double causality (endogeneity); the information provided by this study supports the theory that household with disabled members in LA countries are poorer than households without disabled members. In addition, households whose head had a disability

had a higher probability of being classified as poor or living with a lower level of income. These two main results support the hypothesis that there is an association between disability and poverty in LA.

This study used a large number of sources of information, it also included as dependent variables different measures of poverty (subjective, objective –direct and indirect-) and used different points in time for the analysis. The results were robust and persistent in all the cases, aspects that added to the characteristics of the models and variables included provide support and evidence to the idea that there is an association between disability and poverty.

The research design and the type of data used in the analysis did not allow for the analysis to properly control for possible population causal effects. Given that the design was not experimental and other techniques were not implemented (e.g. matching) it was not possible to recognise the effect that the context plays in the creation of the relationship between disability and poverty. However, the fact that similar results were found, when direct and indirect measures of poverty were used reveals that a positive association between disability and poverty exists. In this context, it is possible to conclude that disability is an important and significant factor that increases the risk of poverty of households in LA countries.

It is recognised that there are limitations and therefore problems of claiming causality in observational and cross-sectional studies. In the case of disability and poverty, it is acknowledged that there are fundamental difficulties in obtaining the right type of data in order to analyse the direction and effect of this relationship. As a consequence, there is a need to accumulate evidence through analysis of existing

data and to support future development of better data in the near future aiming to define what the causal mechanisms of this relationship are.

In summary, in the case of disability and poverty there are severe difficulties analysing the causal relationship. Some of those are associated with endogeneity problems; lack of longitudinal data and difficulties identifying people with disabilities. Nevertheless, it is a necessity to analyse the association between these two conditions. For this study, the effect of disability on the levels of poverty was analysed using a large number of sources of data from five LA countries at different points in time. It was concluded that the presence of at least one member with disability in a household increases the probability of poverty and reduces the household income and that households with disabled members have higher levels of deprivation and multidimensional poverty that households without disabled members.

6. CONCLUSIONS

The relationship between disability and poverty is bidirectional and it is mediated by social exclusion processes. This relationship has been described in the last 15 years, and the knowledge of the socioeconomic characteristics of people with disabilities and their families has increased. Nevertheless, there is still a lack of empirical evidence in the analysis of what the causal mechanism between these two conditions are; what condition is the most influential (poverty or disability) and under what situations do people with disability become poor or do poor individuals become disabled.

LA as a region has only limited empirical evidence that supports the existence of a relationship between disability and poverty. Only a few studies from some countries have been conducted and these presented similar results to the ones from this study. There is still a lack of knowledge on socioeconomic characteristics of people with disabilities, their levels of human and social capital and most important what factors increase the risk of poverty of households with disabled members.

This study provides empirical evidence that supports the idea that disability increases the risk of poverty. The results revealed that the presence of a member with disability in the household increases the probability of being considered as poor and that households with disabled members have higher levels of deprivation and multidimensional poverty. These results are extremely important, given that disability affects not only the levels of income of consumption, how they perceive themselves (subjective poverty), and different dimensions of human development that were included in the MPI.

In general, the evidence included in this study reveals that people with a disability and their families are poorer. Therefore, strategies against poverty should include this group, recognising that people with disabilities are not an homogeneous population, that each individual has different needs and that the strategies should not only aim to provide a minimum income, but also access to basic opportunities such as education, health, labour and social and political participation. This conclusion is based on the analysis built on a perspective of social justice that recognises individual diversity and aims to guarantee human rights.

CHAPTER 11

CONCLUSIONS

This study aimed to determine the risk of poverty for households with disabled members and to compare the levels of multidimensional poverty of households between LA countries. In order to fulfil these objectives two research designs were implemented; a small-N comparative variable oriented analysis and a cross-sectional design.

1. SUMMARY OF THE FINDINGS

The comparative analysis allowed a comparison of the levels of multidimensional poverty between the five LA countries. For each country, the last population census was used as sources of information and the global MPI was calculated using the A-F methodology. The results of the comparative analysis indicate that households with disabled members in Brazil and Mexico have the highest level of multidimensional poverty compared to households without disabled members. Additionally, child mortality and years of schooling of adult members of a household were the two dimensions with the highest contribution to the multidimensional poverty of households with disabled members in these two countries. Moreover, the contribution of those households to the national multidimensional poverty was higher than 20% in four of the five countries included in this study (Chile was the exception), and in all case it was higher than their share of the population.

The cross-sectional design allowed analysing how the risk of being classified as poor changed when a household had at least one member with a disability, using

objective and subjective measures of poverty. Ten national household surveys and one population census were used as source of information for this analysis, and different econometric models were estimated that depended on the characteristics of the dependent variable. In the five cases, similar groups of independent variables were included in the analysis, depending on the data availability. The results revealed that no matter the type of dependent variable that was used, the existence of at least one member with disability in the household increased the risk of poverty of those households. Additionally, if the household had a head with disability the risk of poverty also increased.

In general, the results from both analyses reached a similar conclusion *the presence of a member with disability in a household increases the level of income, subjective and multidimensional poverty of households with disabled members*. It can be concluded that disability increases the risk of poverty of a household in LA and it is a possible cause of poverty.

2. SIGNIFICANCE OF THE FINDINGS

This thesis aimed to test the hypothesis: *households with disabled members have a higher risk of poverty compared with households without disabled members,* in five LA countries and across different periods of time. The results of the comparative and the cross-sectional analysis reached similar conclusions. Indeed, households with disabled members have higher levels of multidimensional poverty than households without disabled members, additionally, in the five countries the risk of being classified as poor increased when the household had at least one member with disabilities or if the head of the household had a disability.

This is the first study in LA, whose main objective was to test the same hypothesis related to the effect of disability on the levels of poverty of a household, in different countries, using different measures of poverty (direct and indirect) as dependent variables. As a consequence, the results of this research are vital for the analysis of the situation of people with disabilities in the region, and their levels of poverty. It is acknowledged that the results do not represent all the realities of people with disabilities and their families in the region. Nevertheless, these results give a general view of the high levels of poverty for people with disabilities and their families in LA.

LA is a heterogeneous region, with high levels of income and opportunity inequality. Although this study did not focus on the analysis of levels of inequality between groups (people with and without disabilities), the results give some insight into the high levels of exclusion from basic services people with disabilities encounter and the inequality of opportunities that these groups also face. The results of this study provide empirical evidence of differences in the level of poverty between households with and without people with disabilities in LA. Evidence shows that disability directly affects the levels of poverty of a family, therefore social policies and strategies to reduce poverty should explicitly include people with disabilities and their families.

The findings of this study reveal that people with disabilities and their families in LA are poor, they have higher levels of deprivation in basic dimensions of development and compared with other poor populations, people with disabilities and their families are in a worse position than households without disabled members. Additionally, the study also provides evidence of the high risk of poverty

households with disabled members present. Added to this, descriptive statistics and previous studies have identified that the low levels of human capital of people with disabilities are an aspect that directly affects the opportunities individuals and their families have to overcome poverty.

As was discussed in chapter 10, it is necessary to explicitly include people with disabilities and their families in development strategies. It is also necessary to implement strategies to increase the access to education services and to the labour market of this group, to guarantee their human rights and to eliminate all sources of discrimination. Disability is associated with poverty, therefore, States should recognise the high risk of poverty that households with disabled members have and provide access to strategies that reduce their risk of becoming poor, or help them to mitigate and overcome poverty.

To summarize, the findings of this study proved the hypothesis tested. This means that households with disabled members have a higher risk of income and subjective poverty and higher levels of multidimensional poverty than households without disabled members. In addition, they are deprived on measurements concerning basic dimensions of development such as education, health and living standard. As a result they should be explicitly mentioned in development strategies and their human rights should be protected and guaranteed by states.

3. Reflections and lessons learned

This is the first study on disability that only uses data from LA and compares to some extent (data allowing) the probability of poverty of households with disabled members in five LA countries. Together these countries represent 64% of the

population in LA, and on average it is possible to say that households with disabled members in LA are poorer than households without disabled members. Although this study did not include the poorest countries in LA, it could be hypothesised that in countries with lower levels of human, economic and social development, the risk of poverty and the levels of multidimensional poverty of people with disabilities and their families will be higher.

This study analyses fifteen different sources of information and uses a varied number of measures of poverty; all this with the main purpose to provide a good quality of evidence on the topic. In general, the hypothesis was proved: *households with disabled individuals have a higher probability of poverty compared with households without disabled members.* In addition if it is the head of the household who has the disability, households have higher risk of poverty, following the same tendency as with the variable households with disability.

Conducting comparative analysis, when working with secondary data is a difficult process. The main limitations are related to how concepts are operationalized by each source of information, and how those concepts respond or not to the same theoretical understanding that the researcher has. Questions on disability have changed in the 15 years (Altman, 2014, Molden and Tossebro, 2010), and depending on the theoretical model behind each of them a different set of the population will respond affirmatively to being disabled or not, having a limitation or impairment, etc. (Grönvik, 2009). This aspect creates an important concern when a comparative study is designed, given that the objective is to analyse populations with similar characteristics. Therefore, it is important to design research that acknowledges the limitations of the concepts, but to some extent

enables a method that allows comparing a concept (variable) between data sources.

This study provides good quality evidence in the analysis of the relationship between disability and poverty. Nevertheless, limitations on the data sources, operationalization of the concepts and different understandings of disability play a role as to what extent it can be claimed that disability is a cause of poverty. As was discussed in previous chapters, without experimental or longitudinal data, it is not possible to know what the causal mechanisms that create the relationship between disability and poverty are and under what conditions disability is a cause of poverty and poverty is a cause of disability or both conditions coexists. However, this should not be a barrier to analysing this relationship, nor to providing evidence on the existence of an association and possible causal relationship between both conditions. As is presented by McKin and Turner (1996) the discovery of causal relationships in social sciences usually start with the analysis of associations and when it is possible causality claims will be made.

It is recognised that in each country, contextual effects play a role that may increase the levels of poverty for households with disabled members. In the analysis conducted in this study, these contextual effects were not analysed. Nevertheless, multilevel analysis can be a useful method to implement, it will be possible to analyse regional differences on the levels of poverty and to control for possible effects of stratified samples. Before using this method it is important to test the assumptions of multilevel models and to define how useful it will be to conduct this type of analysis. In the cases where the analysis is conducted at an individual level and access to basic opportunities are analysed, multilevel models

can provide a possibility to analyse how available services in each region influence the final outcomes.

4. Future Research

Future research in the field of disability and poverty in LA should aim to analyse how individual impairments play a role in the creation of mechanisms that increase individual risks of poverty (social exclusion from education, labour, health care and participation). In addition, it is fundamental to collect information that allows an analysis of the extra costs of each type of impairment (direct, indirect and opportunity costs) in order to propose equivalence scales and incorporate those in future research on poverty.

Other opportunity of research using census data as source of information, it is to conduct an analysis of the levels of multidimensional poverty of people with disabilities and disaggregate by type of impairment and severity and compare within country (regions and urban/rural areas). The information gathered from these analyses will provide evidence on specific regional deprivations for disabled individuals and how the levels of multidimensional poverty of individuals vary between severities and impairments.

It is fundamental to define what dimensions, indicators and weights should be included in a multidimensional measure of poverty for people with disabilities, using individuals as the level of analysis. In this context, it will be possible to compare between different types of impairments. In order to define the dimensions, indicators, weights and cutoffs, people with disabilities should be

included in the process of selection and it is recommended to use participatory approaches in this process.

A further (and related) possibility for conducting future research in the analysis of the relationship between disability and poverty, is to use qualitative methods such as in-depth, semi-structured interviews and focus groups in order to hear the voices of people living with disabilities and their families. This would gather information about what the major mechanisms that increase (or not) their risk of poverty, how families and individuals with disabilities have been able to prevent becoming poor and what strategies (effective or not) they have implemented to access income and/or wealth or overcome poverty.

It is fundamental to measure the impact of social policies and strategies to reduce poverty, including people with disabilities in the process. Comparing the effectiveness of those policies between households with and without disabled members will provide information about how effective or not these types of policies are for this group.

In addition, it is important to analyse and to understand how poverty increases the risk of illness and impairment, but most importantly how the existence of different social and economic barriers can be a cause of disability for poor individuals. Additionally, using quantitative methods, it will be possible to understand if households with a large number of disabled members have similar characteristics and if one such characteristic is being poor (using direct or indirect measures).

Finally, future research in this area should aim to analyse the conditions that affect the most. Information from experiments and natural experiments in the field of disability is unethical and impossible to collect; therefore the number of panel or

longitudinal data sources including questions on disability should increase. This will allow the analysis of levels of poverty and vulnerability of people living with different types of impairments and how poverty is or is not a causal mechanism to becoming ill and what factors influence that a person with impairments become disabled (what type of barriers).

In conclusion, in the study of the relationship between disability and poverty a large number of studies using quantitative, qualitative and mix methods are necessary in order to identify the needs of people with disabilities and their families, to describe their characteristics and most importantly to determine the causal mechanisms between poverty and disability.

5. CONTRIBUTION OF THE RESEARCH

The results of this research contribute to the knowledge about the relationship between disability and poverty in developing countries, with a focused analysis of five countries in LA. As has been discussed, in LA as a region there was a lack of knowledge about poor households with disabled members and most important if disability was a determinant of poverty. The results of this research contribute towards filling the gap on knowledge on these important social issues in the region.

Additionally, the research also contributes to the analysis of global poverty and disability. It provides empirical evidence in the need to include disability as a determinant of poverty and increases the visibility of this topic in the study of poverty.

It is the first cross-country study on disability and poverty that uses the household as the level of analysis. Although it is recognised that intra-household distributions are ignored, aspect that becomes a limitation; it is also acknowledge that most developing countries define their levels of poverty using the household as the level of analysis. Therefore, the evidence obtained by this research goes along with the current analysis of poverty in LMICs around the world and provides useful results for policy makers.

This is the first study that uses the global MPI and disaggregates the data by disability. Even though, the main sources of data, which are commonly used by the calculations of the global MPI (Demographic and health surveys (DHS) and Multiple Indicators Cluster Survey (MICS)), were not used in this analysis, the study provides information about the necessity to disaggregate this type of indices by disability. Nevertheless, the DHS and MICS do not include question on disability in their main questionnaires, and only a few countries have included this question in their last DHS, aspect that makes difficult the use of the global MPI in the analysis of the levels of multidimensional poverty of household with disabled members. In this context, it is vital to call for a data revolution on disability as Mitra (2013) did and emphasise in the importance of collecting comparable data on this topic in all types of household surveys.

This research provides evidence to inform policy makers about the importance of people with disabilities and their families for poverty reduction. Indeed, households with disabled members contribute to a significant percentage to the levels of multidimensional poverty of each of the countries included in this study. This means, that without the proper inclusion of this group it will not be possible

to reach objectives related to elimination of poverty or extreme poverty in each country.

People with disabilities and their families should be recognised as an important and relevant group in the study and analysis of poverty. This group has usually been ignored in development and poverty reduction strategies, and as a consequence current strategies to reduce or eliminate poverty do not cover their additional needs and the extra costs associated with disability. The results of this research provide evidence that supports the need to explicitly incorporate people with disabilities and their families in these policies and strategies, recognising them as a heterogeneous group with different characteristics.

APPENDIX 1

SOCIAL PROTECTION SYSTEMS IN LA

SOCIAL INSURANCE

PENSION SYSTEMS

Two types of pension system can be identified, public and private. The main characteristics of the private system are: defined contributions; non-defined benefits, the final payment depends on the contributions and the return of the investment. It is completely funded (individual account) and it uses a private administration (Mesa-Lago, 2004, 2007b). Public systems are characterised by non-defined contributions, rates are not fixed and depend on the aging of population and the adjustment of the system; the benefits are defined by law; the ways of financing the system are pay as you go (PAYGO) or collective partial capitalization (CPC), with a pooling system among people enrolled into the system, and the system is publically administrated by the State or other institutions (Mesa-Lago, 2004, 2007b).

The mechanisms to distribute economic benefits and risk differ between public and private pension systems. Indeed, in a private system, the economic returns of the investment are for the individual, who owns the account. By contrary, the pooling mechanism used in a public system makes the distribution of benefits among all people contributing to the system. The distribution of risk in a private system is faced only by the individual, contrary to what happens in a public system, where the risks are pooled and are assumed by current and future beneficiaries (Mesa-Lago, 2004, 2007b).

Three types of pension reforms were implemented in LA, with the main difference being the level of substitution or complementarity between public and private sectors. The first reform was the *substitutive model* implemented by Chile, Bolivia, Mexico, El Salvador and the Dominican Republic; under this reform the public system was completely closed and substituted by a private system. The second was the *parallel model*, only implemented in Peru and Colombia and the main characteristic was: the public system was not closed, but reformed and a private system entered into the market and competes against the public. The final reform was the *mixed model*, implemented by Argentina, Uruguay and Costa Rica. The main feature was that it integrated a public system that guarantees a basic pension and a private one that provides a supplementary pension (Mesa-Lago, 2004, 2007b). Finally, some LA countries did not implement structural reforms in their pension systems. In these countries, the pension system is public and covers all individuals who contributed to the systems. Table A1.1 defines the main characteristics of each of the reforms.

Even though the reforms aimed to increase the efficiency of the systems, the percentage of people enrolled in the pension system is less than 50% of the economically active population with the exception of Chile, Uruguay and Costa Rica. The analysis of the distribution of enrolment by income quintiles reveals that people in the lowest quintiles have a lower enrolment rate in the pension system with Chile and Costa Rica as the only two exceptions (ECLAC, 2012, Lindert et al., 2006, Ribe et al., 2010).

TABLE A1. 1. PRIVATE AND PUBLIC PENSION SYSTEMS IN LA

Model and country	System	Contributions	Benefits	Financing	Management
With structural reforms (Private)					
Substitutive model Chile (1981), Bolivia (1997), Mexico (1997) and El Salvador (1998)	Private	Defined	Undefined	Fully funded	Private
Parallel Model Peru (1993) Colombia(1994)	Public or private	Undefined defined	Defined Undefined	Unfunded Full funded	Public Private
Mixed model Argentina (1994) Uruguay (1996) Costa Rica(2001)	Public or private	Undefined Defined	Defined Undefined	Unfunded Fully funded	Public Multiple
Without structural reforms (public) Brazil, Ecuador, Guatemala, Honduras, Nicaragua, Panama, Paraguay and Venezuela	Public	Undefined	Defined	Unfunded	Public

Table amended from: Mesa-Lago (2007b).

HEALTH CARE REFORMS

The reforms in the health care system were not as drastic as in the pension system. In this sector, it is more difficult to implement reforms, because it affects a large percentage (if not all) of the population; the effects of the reforms are immediate instead of deferred; the provision of health care is more complex than of pensions and in general the complex structure of health care systems (providers, services and users) denotes that reforms in these systems are more difficult (Mesa-Lago, 2007b).

Health care reforms followed the same principle of all neoliberal reforms, a competitive market, with a strong private sector. Under this perspective, governments have the main function to regulate the private sector and health care providers. The WB in the World Development Report in 1993, proposed the characteristics the reforms in health care systems should have, those included the decentralization and privatization of health care services; the existence of a basic

benefit package for the whole population and the creation of third party administrators, whose main purpose was the collection and administration of health insurance fees, government subsidies and establishing the contract with health care providers and finally users who select their insurance company according to their willingness to pay for health care (Homedes and Ugalde, 2005).

Countries in LA implemented health care reforms at different times. Argentina, Bolivia, Chile, Colombia, El Salvador and Peru implemented the reforms after the structural reforms in the pension system. Health care reforms in Brazil, Costa Rica, Mexico and Nicaragua preceded pension reforms and Guatemala, Honduras, Panama and Paraguay established health care reforms to some extent, but not reforms in the pension system. In the case of Uruguay a pension reform was implemented but not a health care reform and decentralization processes have had a minimal effect (Mesa-Lago, 2007b).

Health care does not have the characteristics of a perfect market. Indeed, failures in communication between players meant that the reforms implemented in this sector included a major number of concerns associated with information and the role of private providers in the system. In most cases, the main objective of the reforms was to increase equity, efficiency and effectiveness. However, most health care systems in LA have not reached universal coverage, an aspect that has limited the fulfilment of the objectives of these reforms (Mesa-Lago, 2004, 2007a, b).

According to Mesa-Lago (2007b), after the reforms, health care systems in LA countries can be classified into four groups according to coverage; integration; coordination mechanisms and how separate functions are between public and

private sectors. The first group is the tripartite, which includes a public, a private and an insurance system; the second group, is the dual or virtually dual, it includes a social insurance and a private or a public system. The quadripartite presents a public sector divided into contributory and subsidised regimes, private sector and a transitory public sector and finally a unified or single public system. Table A1.2 presents the groups and their main features.

TABLE A1. 2. HEALTH CARE SYSTEMS IN LA COUNTRIES

Health system type	Countries	Characteristics
Tripartite	Argentina Bolivia Ecuador El Salvador Guatemala Honduras Mexico Nicaragua Paraguay Peru Uruguay Venezuela	Low degree of integration Low or no separation of functions Low-medium population coverage
Dual	Brazil Chile Costa Rica Panama	Low-Medium degree of integration Low to high levels of coordination Virtual universal access
Quadripartite	Colombia	Not integrated Well-coordinated Public social insurance sector Coverage from one half to universal
Unified	Cuba	High coverage Total integrated Unified

Amended from Mesa-Lago (2007b).

The objectives of the reforms in health care differed between countries. In countries such as Chile, market-economic principles predominated; in Argentina and Mexico the aims were to improve fiscal balance and efficiency and in Costa Rica equity was the main objective. The type of objectives depended on the balance between private and public sectors and the political environment. Levels of democracy played a fundamental role in the type of health care reforms implemented, Chile is a good example, given that it established a drastic neoliberal

reform under a military dictatorship but included equity concerns under democratic governments during the 1990s (Mesa-Lago, 2007b).

The access to health care systems in LA countries depends to a large extent on working in the formal labour market and on levels of income. Indeed, people in the highest quintiles of income have a higher enrolment rate than people in the lowest quintiles (Barrientos, 2009, Cecchini and Martinez, 2011, ECLAC, 2012, Lindert et al., 2006, Ribe et al., 2010).

In general, reforms in pension and health care systems in LA countries followed similar patterns. The reduction of state role and the increase of the private sector in the provision of services was the main feature in both reforms. However, pension reforms were implemented differently in each county, with Chile as an extreme case with the complete substitution of its public pension for a private system. In addition, health care reforms were not as severe as pension reforms, but in most countries privatization and decentralization processes played a role. In conclusion, both types of reforms aimed to increase the role of private sector, looking to implement market objectives in pension and health care systems. Table A1.3 presents the main characteristics of pensions and health care reforms in LA countries.

TABLE A1. 3. CHARACTERISTICS OF THE REFORMS IN THE PENSION AND HEALTH CARE SYSTEMS

	Pension reform	**Health Reform**	
Policy reforms	Privatization	Liberalizing reforms. Increasing in private actors; decentralization of public services	Expansion. Broader insurance coverage and basic provision
Authoritarian crisis cases			
Chile (1973-1990)	Extensive. Fully substitutive private pillar; all new workers required to join	Extensive. Private health units financed through payroll taxes	None. Target focus on infant mortality
Mexico (until 2000)	Extensive. Fully substitutive private pillar; all new workers required to join	Moderate. Decentralization of MoH but not of social security services. Increase in private insurance	Moderate. Basic healthcare package for those without access to public clinics
Peru (1990-2000)	Moderate/extensive. Mixed system, but most workers join private pillar	Extensive. Primary care teams based on flexible labour contracts, private health units allowed to compete with social security services. Increase in private insurance	Moderate. Expansion of MoH services to poor communities
Venezuela (1999-2006)	None. Did not implement earlier privatization reform	None. Recentralizes health provision	Extensive. Expansion of access to clinics
Democratic crisis cases			
Argentina	Moderate. Mixed system, but substantial rollback of public pillar parameters	Extensive. Opens system to private competition. Brig increase in private insurance	None
Brazil	None. Modest parametric reforms	Mixed. Public sector unified and restructured. Municipalisation of healthcare responsibilities. Limited increase in private insurance.	Substantial. Conditional fiscal transfers to poorer states for improvement in primary health services
Venezuela (until 1999)	Moderate/extensive, Fully substitute private pillar. Elimination of special funds.	Moderate. Transfer agreements with 11 of 23 states. Extensive privatization reforms in 1997 but not implemented.	None
Peru (1980-1990)	None. Major cutbacks in social security spending	No major reforms, but major cuts in health and education spending.	None
Democratic cases, limited crisis			
Costa Rica	Moderate. Mixed system. All workers receive modest benefits from private pillar (2000)	None. Centralization of control by social security funds	Moderate, Establishment of health teams in poor neighbourhoods
Uruguay	Limited. Mixed system with very small private pillar (1996)	None	None
Colombia	Moderate. Mixed system with limited participation in private pillar (1994)	Extensive. Major responsibilities transferred to departments and municipalities. Increase in private providers	Extensive. Large increase in coverage via subsidized insurance packages

Chile (1990-2000)	None, Retains Pinochet privatization but increases regulation of investment funds and increase n minimum guarantees	None. Retains Pinochet reforms but attempts to improve benefits of public systems	Extensive. Expands public care units.

Reproduction from: Haggard and Kaufman (2008).

SOCIAL ASSISTANCE

The structure of social protection systems in LA has determined the importance of social assistance programmes. Indeed, the low percentage of population covered by social insurance; the stratification in the provision of basic social services and the strong relationship between access to social insurance and formal labour market are some of the conditions that have established the need for social assistance (Barrientos, 2013). Additionally, the increases in the levels of poverty, inequality and the percentage of vulnerable population have played a major role in the strong role of social assistance, especially CCT programmes in LA.

Social assistance programmes can be classified into three groups: pure income transfers; income transfers combined with asset accumulation and integrated poverty reduction programmes. The first group includes transfers in cash target to specific groups or poor households. Programmes that provide in cash or kind transfers, whose main purpose is to facilitate the accumulation of productive assets are classified in the second group. Finally integrated poverty reduction programmes include all strategies or interventions designed to reduce poverty or are focused on the poorest (Barrientos, 2013).

Social assistance programmes in LA, have the main role to strengthen the productive capacity of poor households, with a main emphasis in human assets. Two of the most important social assistance programmes in the region are CCTs

and non-contributory pensions. Both strategies have the main purpose to provide in cash or kind transfers to poor and vulnerable populations. Although unemployment rates in LA are relatively high compared to developed countries; only a few countries have implemented unemployment insurance programmes. Indeed, only five of the 18 countries (Brazil, Argentina, Chile, Uruguay and Venezuela) have these programmes in place (Huber et al., 2004, Mesa-Lago, 1999).

CONDITIONAL CASH TRANSFERS (CCTS)

The use of CCT in LA started during the nineties with programmes such as *Bolsa Escola* (Brazil) and *Progresa* (Mexico). After that, more than 35 programmes have been implemented in around 19 countries in Latin America and the Caribbean (LAC). CCTs are programmes that transfer monetary and non-monetary resources to poor families with children. The main conditions usually are associated with regular medical appointments for children and with regular continued attendance in school (Cecchini and Madariaga, 2011).

CCTs have short and long term objectives. The increase of levels of income and consumption of basic goods for poor families is the main short term purpose. In the long run, the improvement on human capital and the reduction of the risk of intergenerational poverty are two of their main objectives (Barrientos and Hinojosa-Valencia, 2009, Barrientos and Hulme, 2008b, Barrientos and Lloyd-Sherlock, 2003, Barrientos and Santibañez, 2009b, Cecchini and Martinez, 2011).

CCTs are the most important programme for poverty reduction in LA. Most countries in the region have implemented them. However, objectives; targeting mechanism; funding systems; administration and basic conditions of the

programme differ between countries and programmes (Barrientos and Santibañez, 2009b, Cecchini and Madariaga, 2011).

Bolsa Escola (Brazil), *Oportunidades* (Mexico) and *Chile Solidario* (Chile) are three of the best known and studied CCTs programmes in LA. The results of impact evaluations have showed that families who received transfers had a higher school attendance and use of health care services. In general, the standard of living of households in the programme was better compared to the control group. *Bolsa Escola* has had a positive impact on the reduction of inequality, but there is not strong evidence of the impact that these programmes have on the reduction of poverty. On the other hand, *Chile Solidario* is an strategy that combines income transfers with interventions in different domains of well-being and aims to provide mechanisms to poor and vulnerable populations to overcome poverty and increase their human, physical and financial assets (Barrientos, 2011a, Barrientos and Santibañez, 2009a, Cecchini and Madariaga, 2011, Cecchini and Martinez, 2011, Rawlings, 2005).

Although CCTs have become the most important strategy to reduce poverty in LA, critiques related to targeting processes and the role of conditionally are relevant in the analysis (Cecchini and Martinez, 2011). Additionally, the perspective of human rights goes against the concept of social assistance programmes that target poor populations, especially in the definition of who the poorest of the poor are and which group should have the priority of those programmes (Rawlings, 2005).

NON-CONTRIBUTORY PENSIONS

The non-contributory pensions are transfers designed to protect elderly and people with disabilities against the risk of poverty. These transfers guarantee a minimum level of income to individuals that did not fulfil the requirements to obtain a pension in the contributory system. These pensions are financed from taxes and are subject to the levels of household or individual income (Barrientos and Lloyd-Sherlock, 2003, FIAP, 2011).

Socioeconomic characteristics of LA countries have influenced the increase in demand for non-contributory pensions. Some examples are: high levels of unemployment, informality and the increase in life expectancy (Barrientos, 2006, Barrientos and Lloyd-Sherlock, 2003). However only six LA countries have implemented these programmes as components of poverty reduction strategies (Bonasol in Bolivia and Chile Solidario). One main cause of the reduced number of countries with non-contributory pensions is the reduced size of the public pillar in the pension system of most LA.

High levels of informality in the labour sector, a small percentage of population contributing to social insurance systems and demographic change have increased the number of old age individuals who need state assistance (Barrientos, 2006). In fact, the demand for non-contributory pensions exceed the supply and this added to budgetary constraints means that the final transfer only covers the cost of a basic basket of goods or be lower or equal than 50% of a minimum contribution pension in most countries (Barrientos and Lloyd-Sherlock, 2003, FIAP, 2011).

People with disabilities are covered to some extent for non-contributory pensions. These pensions are designed to provide a minimum income in order to cover the basic needs of these group and their families. Two basic requirements should be fulfilled 1. to have a severe or moderate impairment that reduces the individual work capacity and 2. to be classified as poor according to the national poverty line. In Brazil and Costa Rica, the person who applies for this benefit should have an appointment with a medical board to determine his/her level of work capacity loss. This evaluation should be periodical (usually every two or three years). Additionally, the continuity of the benefit depends on being out of the labour market reducing incentives to work for people with disabilities (Medeiros et al., 2006, Ribe et al., 2010).

APPENDIX 2

BRAZIL

SOCIAL PROTECTION SYSTEM

Brazil was classified by Mesa-Lago (1991) as a pioneer country in the development of social security systems. It started during the twenties and the expansion of access to social insurance services was related to protect workers in different industrial sectors. In addition, social movements played an important role in the social security reforms that were implemented during the 1980s and 1990s.

SOCIAL INSURANCE

During the 1920s, companies-based insurance funds were created in order provide services to white collar workers. These funds were administrated by companies and regulated by the State. The expansion of coverage was related to the labour sector, an aspect that limited access to social security for the whole population. The development of the system was fragmented and less regulated than in other countries. The expansion was fragmented, this was related to the non-existent pressure by middle income classes (Lewis and Lloyd-Scherlock, 2009).

The first legislation in social security was during the government of Getúlio Vargas (1930-1945), with the creation of a minimum monthly wage; regulations on work for women, minors, labour accidents and number of working hours (Haggard and Kaufman, 2008, Lima, 2003). After this government, the system changed from a company-based to an occupation categories system, which enrolled workers according to type of occupation (Huber, 1996). After 1937, the number of social

funds was reduced to five, those were centralized and state managed, with an expansion of coverage. However, the enrolment for social security was still limited to a small number of occupations and each group had different benefits (Lewis and Lloyd-Scherlock, 2009). Authoritarian governments until the middle of the 1940s meant that competition for votes from medium- and low-income classes was not a priority. As a consequence the welfare system was stratified and it had limited access, which was almost exclusive to high income groups (Haggard and Kaufman, 2008). Democratic governments did not influence the expansion of the system; instead military dictatorship, fiscal and demographic factors played a more important role (Lewis and Lloyd-Scherlock, 2009).

The Ministry of Health was established in 1953. This event was decisive for the expansion of coverage. Moreover, during the 1960s social security institutions associated with labour private organizations were merged into one. However, civil servants and military kept their privileges in social security (Fleury, 2011, Huber, 1996). Until this moment access to social security was exclusive to urban workers, but the high percentage of rural workers and the need to increase coverage to rural areas were the reasons to establish a special system for the rural sector. The *Fund for Assistance to the Rural Workers* (FURURAL) was created in 1963, therefore the number of rural workers enrolled radically increased (Lima, 2003), and by the end of 1980, almost 90% of the workforce was covered by the social security system.

The military dictatorship that took place from 1964 to 1985 extended social security and included domestic workers in 1972 and urban elderly and invalids in 1974 (Huber, 1996). At the end of 1970s, around 90% of the population had access

to health care and other social security services. However, the distribution of resources between social assistance and social insurance systems was unequal, and subsidies to rural workers were smaller than subsidies to workers in the formal sector or the army (Haggard and Kaufman, 2008, Huber, 1996). During the 1970s, the sanitary movement started. It was a social movement in health care, whose main objectives were to prevent a radical transformation of health care and to promote the unification of the health care system (Fleury, 2002, 2009).

After 1985, democratic governments took power and faced the consequences of the 1980s crisis. Inequality, unemployment and exclusion of poor groups from social security exacerbated the negative effects of the crisis (Lima, 2003). Despite the Chilean experience of reforms in its pension and health care systems and the pressure of international entities such as WB for liberal reforms; Brazil did not made major changes to the structure of the system because of the strong resistance of labour organizations and the sanitary movement (Huber, 1996, Lewis and Lloyd-Scherlock, 2009). Although one priority of the democratic governments was the universalization of social security, reaching the poorest sectors of the country, the system had a fiscal crisis due to unemployment and the declining of real wages. In order to reduce the deficit, high cost services were eliminated from the system, despite the opposition of certain urban labour groups (Huber, 1996).

As a result of high levels of corruption and the inefficient access of poor populations, the system was unified and decentralized in 1987. The main purposes were to provide a better coordination between services and to improve quality of health care. Nevertheless, the decentralization process did not have positive

results in the accountability of the system, instead, local governments used the transferences to pursue their own objectives (Huber, 1996).

The Federal Constitution enacted in 1988 brought innovations into the social security system. It incorporated principles of social participation and inclusion, with the main objectives to enlarge the concept of citizenship and equality and to increase levels of democracy. This constitution implicitly included the rights to education, health, work, social assistance and social protection (Fleury, 2011, Lima, 2003). Even though the constitution consolidated the introduction of universal insurance, difficulties in payment of contributions, particularly for poor income earners were some causes of the lack of access to health care in poor areas (Huber, 1996).

Economic problems and pressure from the International Monetary Fund forced the government to apply different austerity policies. The main consequences of those were economic recession and social problems. Policies to control inflation and to reduce the impact of social problems were not effective and were cause of the implementation of a new neoliberal offensive in 1990 that only lasted two years (Huber, 1996).

During the government of Fernando Henrique Cardoso, the requirements to access the system increased, and the final value of the pension was reduced (Antía and Lanzara, 2011). At the same time, social expenditures increased and solidarity programmes to reduce hunger and poverty were incorporated. The government of Lula de Silva introduced other reforms, whose main objectives were to make the system more inclusive and to standardize the regulation for social insurance, with

the main consequence of the creation of private insurance companies and pension funds (Antía and Lanzara, 2011). From 1998 to 2001, the general pension programme that covered employees in the private sector was reformed. The reform introduced actions in the financing and benefits characteristics. In 2003-2004 the pension programme for civil servants was also reformed aiming to unify and to standardize benefits between programmes and groups (Mesa-Lago, 2007b).

The most important results of the universalization process were the increase in the coverage of poor populations and the improvement in social participation. The main characteristics of the system are: a single public authority, integrated health care providers, social control and social participation. The decentralization process was important for the distribution of responsibilities inside the system. Indeed, local government managed local resources, the provision of services was organised in primary and secondary levels of complexity, and the national government had a main role in the design of the system, the definition of basic standards of care and to manage the provision of services on the tertiary level (Fleury, 2002).

Although the decentralization process had positive effects on the accountability of the system, the unequal distribution of human and physical resources had negative impacts on the equity of access to health care. In addition, the provision of care by private insurances and providers has increased as a consequence of the pressure of middle and higher classes (Fleury, 2002, 2011).

The Brazilian National Health System is financed by general taxation and compulsory contributions made to the Ministry of Health. The resources are distributed to local levels according to an equalization formula, which uses

diagnostic related groups (DRG). The access to private insurance companies is voluntary and depends on individual ability to pay. Indeed, 30% of the out-of-pocket payments (OOP) are associated with private insurance (Fleury, 2002).

Brazil has a public pension system that has been reformed since 1998. The first reform was in 1998-2001 and it aimed to strengthen the financial regime of the system by the introduction of modifications in the programme that covered employees in the private sector. In 2003-2004 a process of unification of programmes that covered public and private employees was implemented (Mesa-Lago, 2007b). After these reforms, the Brazilian pension system became a model of four components: 1) general social insurance scheme; 2) special insurance scheme for civil servants; 3) private closed complementary insurance and 4) social assistance. The coverage of the whole system is close to being universal for elderly populations; however benefits are different between social assistance and general pension groups (Antía and Lanzara, 2011).

Finally, unemployment insurance was implemented in 1986. The main objective was to provide resources to individuals, who involuntarily lost their jobs and were looking for a new job in the formal labour market. This insurance was conditional on having worked and looking for a new job in the formal labour sector. Different reforms have been implemented, but still the relation between unemployment insurance and formal employment continues (Cunningham, 2000).

SOCIAL ASSISTANCE

Brazil has one of the oldest social assistance programmes in the region. FURURUAL is a programme to assist informal workers in rural areas. Before the constitution of

1988, social assistance was limited to charity (Barrientos, 2011b, Lewis and Lloyd-Scherlock, 2009), but as a result of the inclusion of principles of equity, universality and citizenship different social assistance programmes were consolidated. FURURAL was recalled *Previdência Rural* in 1991 and it provides support to rural informal female workers, older than 55 years; men older than 60 years and people with a disability (Barrientos and Hinojosa-Valencia, 2009).

The 1988 constitution also established the duty of the State to guarantee a monthly minimum income for people with disabilities and elderly populations. The *Beneficio de Prestação Continuada* started in 1993 as a non-contributory and non-conditional pension programme. This programme targets poor individuals older than 65 years old and people with severe disabilities, who cannot work and do not earn enough money to have a good quality of life (Barrientos and Hinojosa-Valencia, 2009).

After the implementation of the non-conditional pension, different conditional programmes were implemented. The main objectives of those are to develop human capital and to improve human development (Barrientos and Hinojosa-Valencia, 2009). Social assistance programmes were introduced during the Cardoso government and social policies were around three main points: 1) provide basic services to all the population in the country; 2) labour, employment and income programmes; and 3) poverty reduction programmes. Some programmes were inside the universal provision of basic services and others were part of a programme called *Comunidad Solidaria* (Le Bonniec, 2002).

Bolsa Escola was established in 1995 reaching around 4.5 million of families. Its objective is to assist poor households with school age children. Other programmes were *Bolsa Alimentação* and *Auxilio-Gas*. The first programme targeted homeless (indigent) populations and the second was an unconditional programme that subsided households using gas (Barrientos and Hinojosa-Valencia, 2009). During the government of Lula de Silva, *Bolsa Escola, Bolsa Alimentação and Auxilio-Gas* were unified in one conditional cash programme in 2003: *Bolsa de Familia.* This programme covered around 11 million families and it is a CCT, whose main objectives are to increase human capital of future generations and to reduce trans-generational poverty (Haggard and Kaufman, 2008, Mesa-Lago and Marquez, 2007).

BRAZIL PNAD 2008

DESCRIPTIVE STATISTICS

The average age of the population in 2008 was 31 years, with a maximum of 108 (Figure A2.1). 51.4% were female and 83.3% lived in urban areas. Sao Paulo was the most populated region, with 21.6% of the population living in this region. 82% of the population were literate with an average level of education was incomplete fundamental (primary) and 6% of the population had completed graduate degrees (Table A2.1).

FIGURE A2. 1. HISTOGRAM AGE SAMPLE BRAZIL PNAD 2008

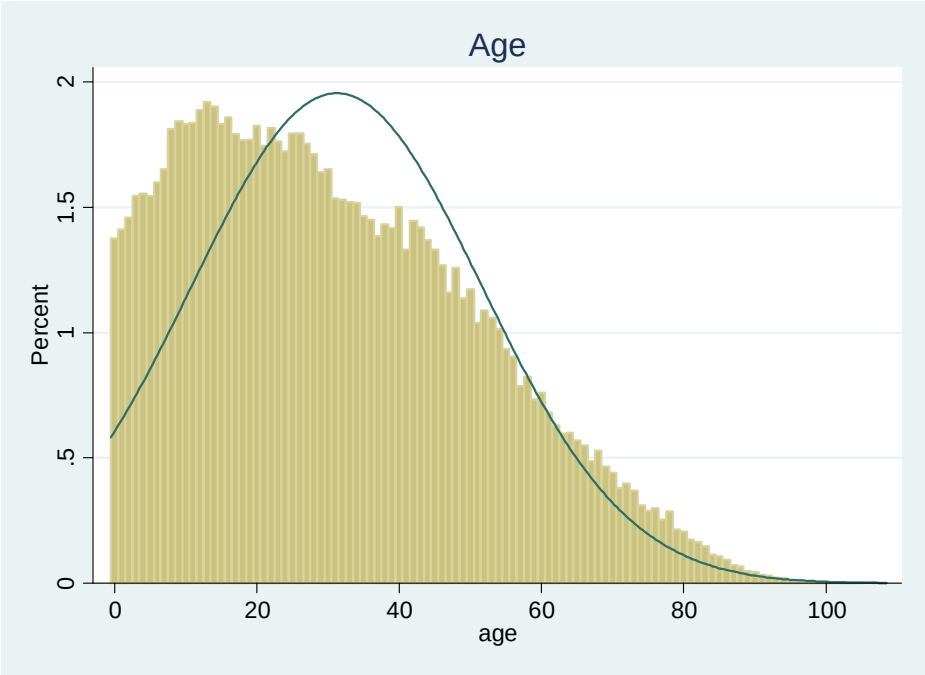


TABLE A2. 1. LEVEL EDUCATION SAMPLE BRAZIL PNAD 2008

	Percentage
No education	21.2
Primary incomplete	37.6
Primary complete	8.2
Secondary school incomplete	6
Secondary school complete	17.3
Professional or higher incomplete	3.2
Professional or higher complete	6.1
No determinate	0.31

The PNAD only asked questions related to activities of daily living (ADL) and physical limitations to people older than 14 years. Questions related to mobility were only asked to people who referred to have a mild ADL impairment or non-impairment. In general, 4.54% of the population reported to live with limitations to take a shower, to get dressed or to feed themselves (Table A2.2).

TABLE A2. 2. PEOPLE LIVING WITH ADL IMPAIRMENT SAMPLE BRAZIL PNAD 2008

	Percentage
Severe limitation	0.6
Moderate limitation	1.3
Mild limitation	2.6
No limitation	95.5

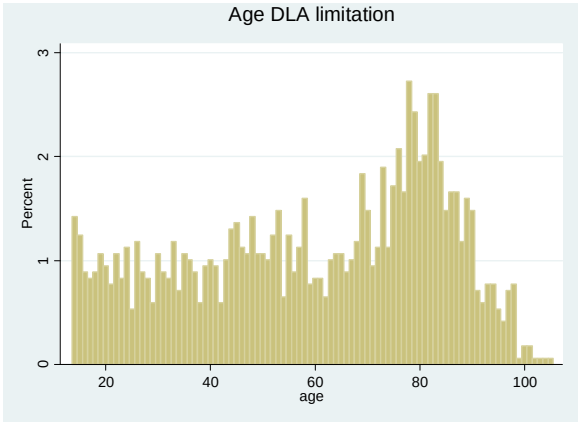
Individuals, who answered to having no limitation or mild limitation in ADL, were asked if because of health they have problems moving tables or doing household chores, climbing stairs, kneeling or bending and walking more than a kilometre. In total, 3.8% of the population have a severe limitation in at least one of those activities, and 12% reported to live with a moderate to severe limitation to run, to lift heavy objects, to practice sports or to do heavy work (Table A2.3).

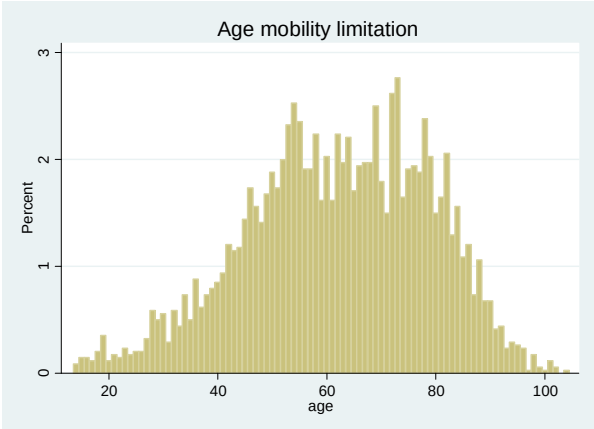
TABLE A2. 3. MOBILITY LIMITATIONS SAMPLE BRAZIL PNAD 2008

	Percentage
Severe limitation	3.79
Moderate limitation	8.33
Mild limitation	10.97
No limitation	76.91

The average age of people with a moderate to severe ADL limitation was 59.6 years old. As expected, individuals older than 70 years referred to have more ADL limitations than younger populations (Figure A2.2). In the case of moderate to severe mobility limitations, the average age was 62 years old. 57.5% of individuals who referred to live with a moderate or severe ADL limitation were women. In the case of mobility limitation, 62% were women.

FIGURE A2. 2. HISTOGRAM AGE ADL AND MOBILITY LIMITATION SAMPLE PNAD 2008





For those with severe ADL impairment 50% did not have any type of education and only 2.3% had completed a graduated degree. In the case of mobility

impairment, around 47% of the population with a severe impairment referred having not completed primary school. The percentage of individuals with high level education was higher for those with a mild impairment. Indeed, for both types of impairments there was a negative association between level of education and severity of the disability (Table A2.4 and Table A2.5).

TABLE A2. 4. EDUCATION LEVEL ADL IMPAIRMENT SAMPLE BRAZIL PNAD 2008

ADL impairment	No education	Fundamental incomplete	Fundamental complete	Media incomplete	Media complete	University incomplete	University complete
Severe limitation	49.9	31.52	5.07	1.54	8.96	0.66	2.34
Moderate limitation	39.19	39.16	6.55	2.38	8.98	0.9	2.63
Mild limitation	29.96	43.18	7.74	3.02	11.37	1.21	3.37
No limitation	9.71	35.53	10.83	8.01	23.06	4.34	8.1
Total	10.87	35.75	10.66	7.77	22.48	4.19	7.87

TABLE A2. 5. EDUCATION LEVEL MOBILITY IMPAIRMENT SAMPLE BRAZIL PNAD 2008

Mobility impairment	No education	Fundamental incomplete	Fundamental complete	Media incomplete	Media complete	University incomplete	University complete
Severe limitation	30.65	46.67	6.8	2.24	9.31	0.89	3.27
Moderate limitation	24.18	46.3	8.21	3.12	12.43	1.12	4.34
Mild limitation	16.38	42.75	9.73	4.73	17.08	2.29	6.73
No limitation	6.87	33.05	11.37	9.12	25.33	5.05	8.78
Total	10.25	35.73	10.75	7.88	22.74	4.26	7.98

In terms of working condition of people with severe ADL, 86% answered that they did not do any economic activity the year before. In the case of mobility limitation, 62% were not working during the previous year.

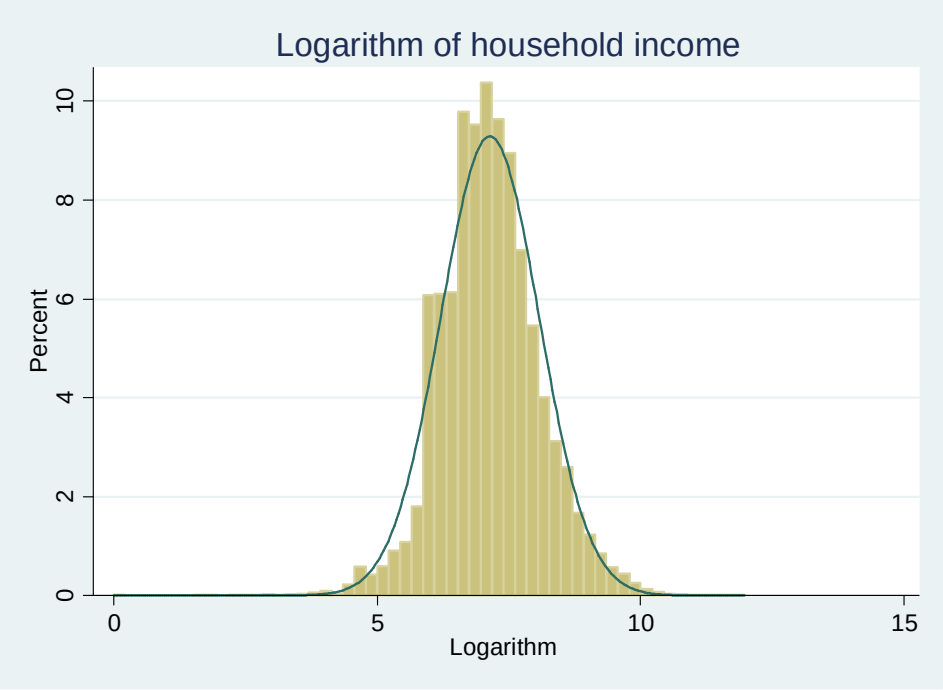
VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLES

Logarithm of income of the household: Variable created using the total income of the household, which was the sum of labour income, rents, pensions and benefits

from social assistance programmes. The variable income was transformed to logarithm aiming to reduce skewness and kurtosis of the distribution (Figure A2.3).

FIGURE A2. 3. LOGARITHM OF HOUSEHOLD INCOME BRAZIL PNAD 2008



INDEPENDENT VARIABLES

1. *Household Characteristics*:
    a. *Disability in the household*[35]*:* This variable was created using information from six questions related to difficulties or limitations in ADL and mobility activities. Only individuals who reported to live with a severe to moderate ADL or mobility limitations were label as disabled. A variable was created, which represented the existence of a member with disability in the household (Table A2.6).

[35] It is important to highlight that questions related to limitations or difficulties were only asked to individuals older than 14 years old, and there was not information related to sensorial, mental, cognitive or other type of limitations in the survey.

TABLE A2. 6. DISABILITY HOUSEHOLD BRAZIL PNAD 2008

	Percentage
No disability	92.6
Disability	7.4

b. *Number of elderly members (older than 65 years old):* Continuous variable that represented the number of individuals older than 65 years in a household. It took values between 0 and 2 (Table A2.7).

TABLE A2. 7. ELDERLY HOUSEHOLD BRAZIL PNAD 2008

Number elderly household	Percentage
0	84
1	12
2 or more	4

c. Number of children (members younger than 12 years old): Continuous variable that represented the number of individuals younger than 12 in each household It took values between 0 and 5 (Table A2.8).

TABLE A2. 8. CHILDREN HOUSEHOLD BRAZIL PNAD 2008

Children per household	Percentage
0	46
1	29
2	16
3	6
4	2
5 or more	1

d. Number of working individuals per household: Continuous variable, whose values were between 0 to 5 individuals. This variable represented the number of individuals older than 10 years old that were working in the reference week of the survey (Table A2.9).

TABLE A2. 9. WORKING INDIVIDUALS BRAZIL PNAD 2008

Number working individuals	Percentage
0	10
1	34
2	35
3	14
4	5
5	3

e. *Size of household:* Continuous variable that took values between 0 and 21, with an average of 4 individuals per household.

2. *Area:* Dichotomous variable that took the value of 1 when the person was living in urban area and 0 in rural area (Table A2.10).

TABLE A2. 10. AREA BRAZIL PNAD 2008

	Percentage
Rural	16
Urban	84

3. *Regions:* Dichotomous variables that represent each of the regions of Brazil. Each of them takes the value of 1 when the person lives in that region and 0 when not. Amazonas was the reference variable.

4. *Head of household characteristics:*

   a. *Age:* Continuous variable with an average of 46.4 years, and values between 10 and 108.

   b. *Age square:* Continuous variable that represented the square of the age of the head of household. It took values between 100 and 11,664.

   c. *Sex head household:* Dichotomous variable that took the value of one if the head of household was female. 68% of the population lived in a household with a male head (Table A2.11).

TABLE A2. 11. SEX HEAD HOUSEHOLD BRAZIL PNAD 2008

	Percentage
Male head	0.68
Female head	0.32

d. *Level of education of head of the household:* Around 40% of the population in Brazil lived in a household where the head had less than primary school. In addition, 16% of individuals lived in households where the head had no education (Table A2.12).

TABLE A2. 12. LEVEL OF EDUCATION HEAD OF THE HOUSEHOLD BRAZIL PNAD 2008

Head level education	Percentage
No education	0.16
Primary incomplete	0.40
Primary complete	0.10
Secondary incomplete	0.05
Secondary complete	0.20
Professional incomplete	0.03
Professional complete	0.08

e. Working head of the household: Dichotomous variable that took the value of 0 if the head of household was not working and receiving a salary week previous the interview and one if was working and earning a salary (Table A2.13).

TABLE A2. 13. WORKING HEAD OF THE HOUSEHOLD BRAZIL PNAD 2008

	Percentage
No working head	0.284
Working head	0.716

f. *Ethnic group head of the household:* Dichotomous variables that took the value of one depending on the ethnic group of the head of household. 43.1% of the individuals were living in households with a white head (Table A2.14).

TABLE A2. 14. ETHNIC GROUP HEAD OF THE HOUSEHOLD BRAZIL PNAD 2008

Ethnic group head	Percentage
Indigenous	0.004
White	0.43
Black	0.091
Asian	0.005
Mixed Race	0.47

g. *Head severe or moderate ADL impairment:* Dichotomous variable with value equal to one if the person was living in a household whose head had a severe or moderate ADL limitation and 0 in other cases (Table A2.15).

TABLE A2. 15. HEAD WITH SEVERE OR MODERATE ADL IMPAIRMENT BRAZIL PNAD 2008

	Percentage
No	98.2
Yes	1.8

h. *Head severe or moderate mobility limitation:* Dichotomous variable with value equal to one if the person was living in a household whose head had a severe or moderate mobility limitation and 0 in other cases (Table A2.16).

TABLE A2. 16. HEAD WITH SEVERE OR MODERATE ADL IMPAIRMENT BRAZIL PNAD 2008

	Percentage
No	98.6
Yes	1.4

5. *Poorest 40% according to the asset index:* Dichotomous variable with value equal to one if the person lived in a household that according to the asset index was in the poorest 40%.

a. Asset index: Index that combines information related to ownership of assets and characteristics of the dwelling. Each variable included was dichotomous; it took the value of one when the household

owned an asset or the dwelling had a specific characteristic. Following the suggestions made by Filmer and Pritchett (2001) all variables were combined using principal component analysis and the first component was selected as the asset index.

The first component explained the variance of the variables by 13.48%. Even though this is a small value, the signs associated with the variables included were the expected in most cases, except for the variable motorcycle. The results of the first component are presented in table A2.17. The index increased when the household had better characteristics and had an asset (except motorcycle). The variable with the highest value was to have a public system of waste collection.

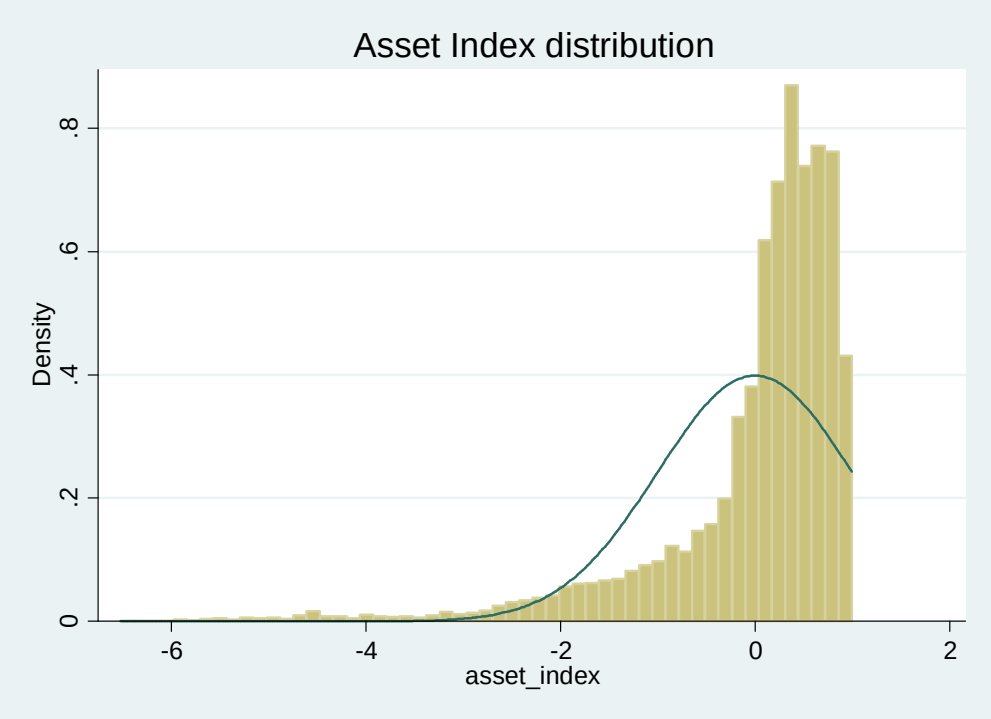
TABLE A2. 17. FIRST COMPONENT ASSET INDEX BRAZIL PNAD 2008

Variable	Component 1
Material walls: Brick	0.1647
Material walls: Wood	-0.113
Material walls: Adobe	-0.1233
Material walls: Wood harnessed	-0.0416
Material walls: straw	-0.0534
Material walls: Other materials	-0.0343
Material ceiling: Tiles	-0.083
Material ceiling: Brick	0.1255
Material ceiling: Wood	-0.0203
Material ceiling: Zinc	-0.0247
Material ceiling: Wood harnessed	-0.0113
Material ceiling: Straw	-0.1343
Material ceiling: Other material	-0.0105
Source water: Public aqueduct	0.2613
Source water: Well	-0.0967
Source of water: Other source of water	-0.0188
Source of water: No water	-0.2606
Sewerage: No swage	-0.2234
Sewerage: Public	0.1874
Sewerage: Septic fosse	0.0454
Sewerage: Fosse no connected	-0.0072
Sewerage: Fosse	-0.1164
Sewerage: Ditch	-0.0497
Sewerage: River	-0.0099

Sewerage: Other	-0.0139
Waste collection: Public system	0.2958
Waste collection: Burn	-0.2584
Waste collection: throw street	-0.1285
Waste collection: Other	-0.0189
Source electricity: Public system	0.2264
Source electricity: Kerosene	-0.2183
Source electricity: Other source	-0.0617
Energy cooking: Gas bottle	0.2261
Energy cooking: Gas natural	0.031
Energy cooking: firewood	-0.2215
Energy cooking: Coal	-0.1027
Energy cooking: Electricity	0.0018
Energy cooking: Other sources	-0.0032
Energy cooking: No	-0.0794
Mobile phone	0.2006
Stove	0.0794
Car	0.1358
Motorcycle	-0.0115
Radio	0.0939
TV	0.207
DVD	0.1821
Fridge	0.2269
Washing machine	0.1669
PC	0.1638

The distribution of the asset index in the total sample is presented Figure A2.4. Figure A2.5 presents the differences between the contribution of each variable to the asset index in rural and urban areas.

FIGURE A2. 4. ASSET INDEX DISTRIBUTION BRAZIL PNAD 2008



6. *Type of ownership of the dwelling:*

   a. *Own the property:* Dichotomous variable with value equal than one if the family owned the household where they were living. It included the options of owns the house and owns the house but is paying a mortgage.

   b. *Rent the property*: Dichotomous variable with value equal than one if the family lived in a rented house or a flat.

   c. *Borrow the property*: Dichotomous variable with value equal than one if the family lived in a house or apartment that was given by an employer, an institution or other person.

d. *Other:* This variable included other options of ownership of dwelling (e.g. encroachment). It took the value of one if the dwelling where the family lived was occupied under these conditions and 0 if not.

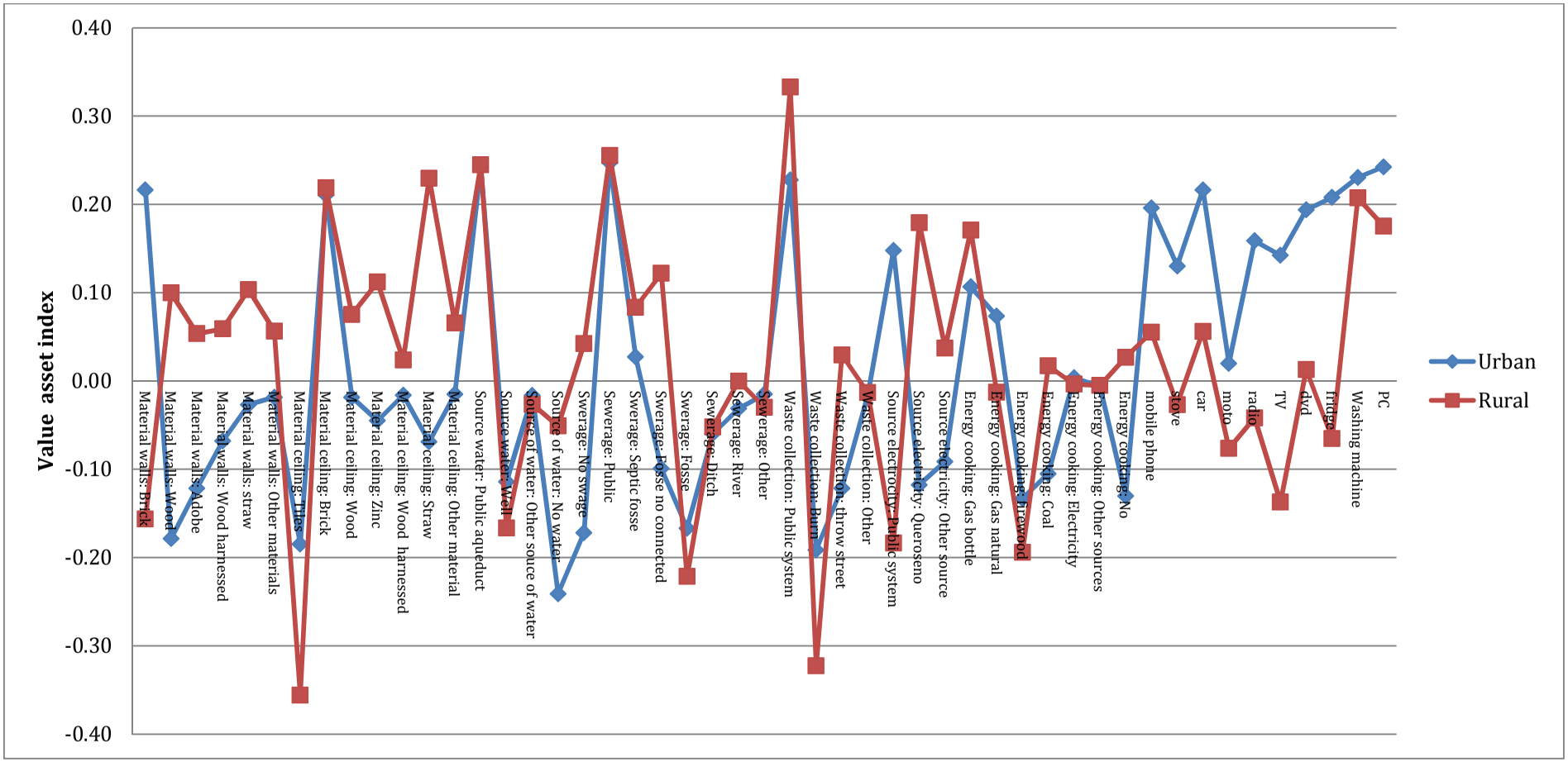
7. *No school attendance:* Dichotomous variable with values equal than one when the household had one or more school age children[36] not attending school.

8. *Child work*: Dichotomous variable with values equal than one when the household had one or more children working.

9. *Disability and poorest 40% asset index:* Dichotomous variable that represented that a household had at least one member with severe or moderate ADL or mobility impairment and was in the poorest 40% according to the asset index.

[36] According to the legislation in Brazil, children in school age are older than five and younger than 14

FIGURE A2. 5. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS BRAZIL PNAD 2008



CROSS-SECTIONAL ANALYSIS

RESULTS MODEL 1A

Dependent variable logarithm household income

Independent variable: Including presence of at least one member with disability in the household.

TABLE A2. 18. RESULTS MODEL 1A BRAZIL PNAD 2008 (DEPENDENT VARIABLE: LOGARITHM HOUSEHOLD INCOME)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Disability household	-0.06***	-0.06***	0	0	0.01***	-0.04***	-0.04***	-0.03***
Working with salary	0.30***	0.31***	0.29***	0.29***	0.27***	0.27***	0.27***	0.27***
Size household	0.01***	0.03***	0.04***	0.04***	0.04***	0.04***	0.04***	0.04***
Number children	-0.17***	-0.15***	-0.08***	-0.07***	-0.06***	-0.06***	-0.06***	-0.06***
Number elderly	0.25***	0.28***	0.19***	0.19***	0.19***	0.19***	0.19***	0.19***
Rondania		0.02*	0.07***	0.08***	0.13***	0.14***	0.14***	0.14***
Avre		-0.09***	-0.05***	-0.05***	0	0.00	0.01	0.01
Roraima		-0.01	0	0	-0.02		-0.04	-0.02
Para		-0.08***	-0.05***	-0.05***	0.01	0.01	0.01	0.01
Amapa		0	-0.02	-0.02	0.07***	0.07***	0.07***	0.07***
Tocantins		-0.10***	-0.06***	-0.05***	-0.03**	-0.03**	-0.03**	-0.03**
Maranhao		-0.32***	-0.23***	-0.23***	-0.22***	-0.22***	-0.22***	-0.22***
Piaui		-0.39***	-0.29***	-0.28***	-0.28***	-0.28***	-0.29***	-0.28***
Ceara		-0.32***	-0.25***	-0.25***	-0.27***	-0.27***	-0.27***	-0.27***
Rigo_Grande		-0.18***	-0.12***	-0.12***	-0.15***	-0.15***	-0.15***	-0.15***
Paraiba		-0.32***	-0.23***	-0.23***	-0.26***	-0.26***	-0.26***	-0.26***
Pernambuco		-0.27***	-0.24***	-0.24***	-0.27***	-0.27***	-0.27***	-0.27***
Alagoas		-0.36***	-0.27***	-0.27***	-0.27***	-0.27***	-0.27***	-0.27***
Sergipe		-0.26***	-0.20***	-0.20***	-0.27***	-0.27***	-0.27***	-0.27***
Bahia		-0.26***	-0.18***	-0.18***	-0.24***	-0.24***	-0.24***	-0.24***
Minas Gerais		0.05***	0.06***	0.06***	-0.05***	-0.05***	-0.05***	-0.05***
Espirito Santo		0.06***	0.06***	0.06***	-0.03***	-0.03***	-0.03***	-0.03***

Rio Janeiro		0.20***	0.10***	0.10***	-0.01		-0.02	-0.01
Sao Paulo		0.30***	0.20***	0.20***	0.06***	0.06***	0.06***	0.06***
Parana		0.25***	0.14***	0.14***	0.08***	0.08***	0.08***	0.08***
Santa Catarina		0.36***	0.22***	0.22***	0.18***	0.18***	0.18***	0.18***
Rio Grande		0.25***	0.14***	0.15***	0.09***	0.09***	0.09***	0.09***
Mato Grosso Sur		0.11***	0.10***	0.11***	0.13***	0.13***	0.13***	0.13***
Mato Grosso		0.16***	0.16***	0.17***	0.17***	0.17***	0.17***	0.17***
Goias		0.06***	0.10***	0.10***	0.09***	0.09***	0.09***	0.09***
Distrito Federal		0.56***	0.39***	0.39***	0.25***	0.25***	0.25***	0.25***
Urban		0.58***	0.36***	0.34***	0.17***	0.17***	0.17***	0.17***
Female head household			-0.15***	-0.15***	-0.14***	-0.14***	-0.14***	-0.14***
Age head household			0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
Age head household square			-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
Working head household			-0.04***	-0.04***	-0.03***	-0.03***	-0.03***	-0.03***
Fundamental complete head			0.22***	0.22***	0.17***	0.17***	0.17***	0.17***
Fundamental incomplete head			0.45***	0.44***	0.35***	0.35***	0.35***	0.34***
Media incomplete head			0.52***	0.51***	0.41***	0.41***	0.41***	0.41***
Media complete head			0.76***	0.75***	0.61***	0.61***	0.61***	0.61***
Superior incomplete head			1.21***	1.20***	1.03***	1.03***	1.02***	1.02***
Superior complete head			1.57***	1.56***	1.39***	1.39***	1.39***	1.39***
Indigenous head			-0.17***	-0.18***	-0.16***	-0.16***	-0.16***	-0.16***
Black head			-0.17***	-0.17***	-0.16***	-0.16***	-0.16***	-0.16***
Amerela head			-0.05***	-0.05***	-0.06***	-0.06***	-0.06***	-0.05***
Prada head			-0.14***	-0.14***	-0.13***	-0.13***	-0.13***	-0.13***
Own dwelling				0.22***	0.18***	0.18***	0.18***	0.18***
Rented dwelling				0.25***	0.21***	0.21***	0.21***	0.21***
Borrow dwelling				0.09***	0.09***	0.09***	0.09***	0.08***
Poorest 40%					-0.40***	-0.41***	-0.41***	-0.41***
Disability and poorest 40%						0.10***	0.10***	0.10***
No school attendence							-0.08***	-0.08***
Working children								-0.26***
Constant	6.66***	6.05***	5.10***	4.93***	5.50***	5.51***	5.51***	5.51***
N	375603	375603	375603	375603	375603	375603	375603	375603
ll	-4.70E+05	-4.36E+05	-3.68E+05	-3.67E+05	-3.56E+05		-712000	-3.56E+05

r2	0.18	0.32	0.52	0.53	0.55	0.55	0.55	0.55
AIC	939280.77	871810.26	736408.46	734920.04	713092.35	712918.15	712798.12	712525.43
BIC	939345.79	872167.86	736917.77	735461.86	713645	713481.63	713372.44	713110.58

***p-value>0.01; **>0.05; *>0.1

RESULTS MODEL 1B

Dependent variable: Natural logarithm of household income

Independent variable: Head type of impairment

TABLE A2. 19. RESULTS MODEL 1B BRAZIL PNAD 2008 (DEPENDENT VARIABLE: LOGARITHM HOUSEHOLD INCOME)

Variable	Mode 1	Mode 2	Mode 3	Mode 4	Model 5	Model 6
Working with salary	0.29***	0.29***	0.27***	0.27***	0.27***	0.27***
Size household	0.04***	0.04***	0.04***	0.04***	0.04***	0.04***
Number children	-0.08***	-0.07***	-0.06***	-0.06***	-0.06***	-0.06***
Number elderly	0.19***	0.19***	0.19***	0.18***	0.18***	0.18***
Rondania	0.08***	0.08***	0.13***	0.14***	0.14***	0.14***
Avre	-0.05***	-0.05***	0	0	0.01	0.01
Roraima	0	0	-0.02	-0.02	-0.02	-0.02
Para	-0.05***	-0.05***	0.01	0.01	0.01	0.01
Amapa	-0.01	-0.02	0.07***	0.07***	0.07***	0.07***
Tocantins	-0.06***	-0.05***	-0.03**	-0.03**	-0.03**	-0.03**
Maranhao	-0.23***	-0.23***	-0.22***	-0.22***	-0.22***	-0.22***
Piaui	-0.29***	-0.28***	-0.28***	-0.28***	-0.28***	-0.28***
Ceara	-0.25***	-0.25***	-0.27***	-0.27***	-0.27***	-0.27***
Rigo_Grande	-0.12***	-0.12***	-0.15***	-0.15***	-0.15***	-0.15***
Paraiba	-0.23***	-0.23***	-0.26***	-0.26***	-0.26***	-0.26***
Pernambuco	-0.24***	-0.24***	-0.27***	-0.27***	-0.27***	-0.27***
Alagoas	-0.27***	-0.27***	-0.27***	-0.27***	-0.27***	-0.27***
Sergipe	-0.20***	-0.20***	-0.27***	-0.27***	-0.27***	-0.27***
Bahia	-0.18***	-0.18***	-0.24***	-0.24***	-0.24***	-0.24***

Minas Gerais	0.06***	0.06***	-0.05***	-0.05***	-0.05***	-0.05***
Espirito Santo	0.06***	0.06***	-0.03***	-0.03***	-0.03***	-0.03***
Rio Janeiro	0.10***	0.10***	-0.01	-0.01	-0.01	-0.01
Sao Paulo	0.20***	0.20***	0.06***	0.06***	0.06***	0.06***
Parana	0.14***	0.14***	0.08***	0.08***	0.08***	0.08***
Santa Catarina	0.22***	0.22***	0.18***	0.18***	0.18***	0.18***
Rio Grande	0.14***	0.15***	0.09***	0.09***	0.09***	0.09***
Mato Grosso Sur	0.10***	0.11***	0.13***	0.13***	0.13***	0.13***
Mato Grosso	0.16***	0.17***	0.17***	0.17***	0.17***	0.17***
Goias	0.10***	0.10***	0.09***	0.09***	0.09***	0.09***
Distrito Federal	0.39***	0.39***	0.25***	0.25***	0.25***	0.25***
Urban	0.36***	0.34***	0.17***	0.17***	0.17***	0.17***
Female head household	-0.15***	-0.15***	-0.14***	-0.14***	-0.14***	-0.14***
Age head household	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
Age head household square	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
Working head household	-0.04***	-0.04***	-0.03***	-0.03***	-0.03***	-0.03***
Fundamental complete head	0.22***	0.22***	0.17***	0.17***	0.17***	0.17***
Fundamental incomplete head	0.44***	0.44***	0.34***	0.35***	0.34***	0.34***
Media incomplete head	0.52***	0.51***	0.41***	0.41***	0.41***	0.40***
Media complete head	0.76***	0.75***	0.61***	0.61***	0.61***	0.61***
Superior incomplete head	1.21***	1.20***	1.02***	1.02***	1.02***	1.02***
Superior complete head	1.56***	1.56***	1.39***	1.39***	1.39***	1.39***
Indigenous head	-0.17***	-0.18***	-0.16***	-0.16***	-0.16***	-0.16***
Black head	-0.17***	-0.17***	-0.16***	-0.16***	-0.16***	-0.16***
Amerela head	-0.05***	-0.05***	-0.06***	-0.06***	-0.06***	-0.06***
Prada head	-0.14***	-0.14***	-0.13***	-0.13***	-0.13***	-0.13***
Head ADL severe moderate	-0.09***	-0.09***	-0.07***	-0.13***	-0.13***	-0.13***
Head mobility severe moderate	-0.08***	-0.08***	-0.06***	-0.12***	-0.12***	-0.12***
Own dwelling		0.21***	0.18***	0.18***	0.18***	0.18***
Rented dwelling		0.25***	0.21***	0.21***	0.21***	0.21***
Borrow dwelling		0.09***	0.09***	0.09***	0.09***	0.08***
Poorest 40%			-0.40***	-0.41***	-0.41***	-0.41***
Disability and poorest 40%				0.13***	0.13***	0.13***
No school attendance					-0.08***	-0.08***

Working children						-0.26***
Constant	5.12***	4.94***	5.51***	5.53***	5.53***	5.53***
N	375603	375603	375603	375603	375603	375603
ll	-3.68E+05	-3.67E+05	-3.56E+05	-356000	-3.56E+05	-3.56E+05
r2	0.52	0.53	0.55	0.55	0.55	0.55
AIC	736216.08	734733.78	712979.8	712604.66	712482.42	712212.86
BIC	736736.22	735286.43	713543.29	713178.98	713067.57	712808.86

***p-value>0.01; **>0.05; *>0.1

RESULTS MODEL 2A

Marginal effects generalize ordinal logit Model A.

Dependent variable: Income classification.

Independent variable: Disability household

TABLE A2. 20. RESULTS MODEL 2A BRAZIL PNAD 2008 (DEPENDENT VARIABLE: INCOME CLASSIFICATION)

	Living with less than a MW	**Between 1 and 5 MW**	**More than 5 MW**
Disability household	0.01***	-0.02***	0.002
Working with salary	-0.13***	0.11***	0.016***
Size household	0.10***	-0.07***	-0.021***
Number children	0.03***	-0.02***	-0.001
Number elderly	-0.06***	0.06***	0.005**
Rondania	-0.04***	0.03*	0.012
Avre	0.00	-0.01	0.010
Roraima	0.03	-0.04	0.012
Para	0.02*	-0.04**	0.011
Amapa	0.01	0.02	-0.029**
Tocantins	0.04**	-0.06***	0.018**
Maranhao	0.12***	-0.12***	0.004
Piaui	0.11***	-0.13***	0.013
Ceara	0.14***	-0.14***	0.000
Rigo_Grande	0.07***	-0.07***	0.007
Paraiba	0.14***	-0.15***	0.009
Pernambuco	0.13***	-0.13***	0.000
Alagoas	0.13***	-0.13***	0.003
Sergipe	0.11***	-0.12***	0.006
Bahia	0.12***	-0.13***	0.011*
Minas Gerais	0.05***	-0.05***	0.004
Espirito Santo	0.04**	-0.04**	0.003

Rio Janeiro	0.03	-0.04***	0.009
Sao Paulo	-0.02	0.02	0.001
Parana	-0.02	0.02	0.002
Santa Catarina	-0.07***	0.07***	0.002
Rio Grande	-0.03**	0.02	0.008
Mato Grosso Sur	-0.01	-0.01	0.016**
Mato Grosso	-0.03*	0.01	0.019**
Goias	0.00	-0.01	0.011*
Distrito Federal	-0.04**	-0.01	0.047***
Urban	-0.05***	0.05***	-0.002
Female head household	0.05***	-0.04***	-0.015***
Age head household	-0.01***	0.01***	0.002***
Age head household square	0.00***	0.00***	0.000**
Working head household	0.03***	-0.03***	-0.001
Fundamental complete head	-0.09***	0.05***	0.031***
Fundamental incomplete head	-0.16***	0.10***	0.054***
Media incomplete head	-0.18***	0.12***	0.063***
Media complete head	-0.26***	0.18***	0.081***
Superior incomplete head	-0.41***	0.30***	0.114***
Superior complete head	-0.48***	0.34***	0.142***
Indigenous head	0.06***	-0.06***	0.000
Black head	0.06***	-0.03***	-0.027***
Asian race head	0.01	-0.01	-0.003
Mix race head	0.05***	-0.03***	-0.019***
Own dwelling	-0.07***	0.06***	0.006
Rented dwelling	-0.08***	0.07***	0.008
Borrow dwelling	-0.01	0.03	-0.016
Poorest 40%	0.16***	-0.12***	-0.039***
No school attendance	0.07***	-0.07***	0.002
Working children	0.05	-0.04	-0.010

***p-value>0.01; **>0.05; *>0.1

RESULTS MODEL 2B

Marginal effects generalize ordinal logit Model B.

Dependent variable: Income classification.

Independent variable: Disability household

TABLE A2. 21. RESULTS MODEL 2B BRAZIL PNAD 2008(DEPENDENT VARIABLE: INCOME CLASSIFICATION)

	Living with less than a MW	**Between 1 and 5 MW**	**More than 5 MW**
Working with salary	-0.13***	0.11***	0.02***
Size household	0.10***	-0.07***	-0.02***
Number children	0.02***	-0.02***	0.00
Number elderly	-0.06***	0.06***	0.00***
Rondania	-0.04***	0.03*	0.01
Avre	0.00	-0.01	0.01
Roraima	0.03	-0.04	0.01
Para	0.02*	-0.03**	0.01
Amapa	0.01	0.02	-0.03**
Tocantins	0.04*	-0.06***	0.02**
Maranhao	0.12***	-0.12***	0.00
Piaui	0.11***	-0.12***	0.01
Ceara	0.14***	-0.14***	0.00
Rigo_Grande	0.07***	-0.07***	0.01
Paraiba	0.14***	-0.15***	0.01
Pernambuco	0.13***	-0.13***	0.00
Alagoas	0.13***	-0.13***	0.00
Sergipe	0.11***	-0.12***	0.01
Bahia	0.12***	-0.13***	0.01
Minas Gerais	0.04***	-0.05***	0.00
Espirito Santo	0.04***	-0.04**	0.00
Rio Janeiro	0.03**	-0.04**	0.01

Sao Paulo	-0.02	0.02	0.00
Parana	-0.02	0.02	0.00
Santa Catarina	-0.07***	0.07***	0.00
Rio Grande	-0.03**	0.02	0.01
Mato Grosso Sur	-0.01	0.00	0.02**
Mato Grosso	-0.03**	0.01	0.02**
Goias	0.00	-0.01	0.01*
Distrito Federal	-0.04***	-0.01	0.05***
Urban	-0.05***	0.05***	0.00
Female head household	0.05***	-0.04***	-0.02***
Age head household	-0.01***	0.01***	0.00***
Age head household square	0.00***	0.00***	0.00**
Working head household	0.03***	-0.03***	0.00
Fundamental complete head	-0.09***	0.05***	0.03***
Fundamental incomplete head	-0.16***	0.10***	0.05***
Media incomplete head	-0.18***	0.12***	0.06***
Media complete head	-0.26***	0.18***	0.08***
Superior incomplete head	-0.41***	0.30***	0.11***
Superior complete head	-0.48***	0.34***	0.14***
Indigenous head	0.06***	-0.06***	0.00
Black head	0.06***	-0.03***	-0.03***
Asian head	0.02	-0.01	0.00
Mix race head	0.05***	-0.03***	-0.02
Head ADL severe moderate	0.06***	-0.05***	-0.01
Head mobility severe moderate	0.04***	-0.03***	-0.01
Own dwelling	-0.07***	0.06***	0.01
Rented dwelling	-0.08***	0.07***	0.01
Borrow dwelling	-0.01	0.03	-0.02
Poorest 40%	0.16***	-0.12***	-0.04***
No school attendance	0.07***	-0.07***	0.00
Child work	0.05	-0.04	-0.01

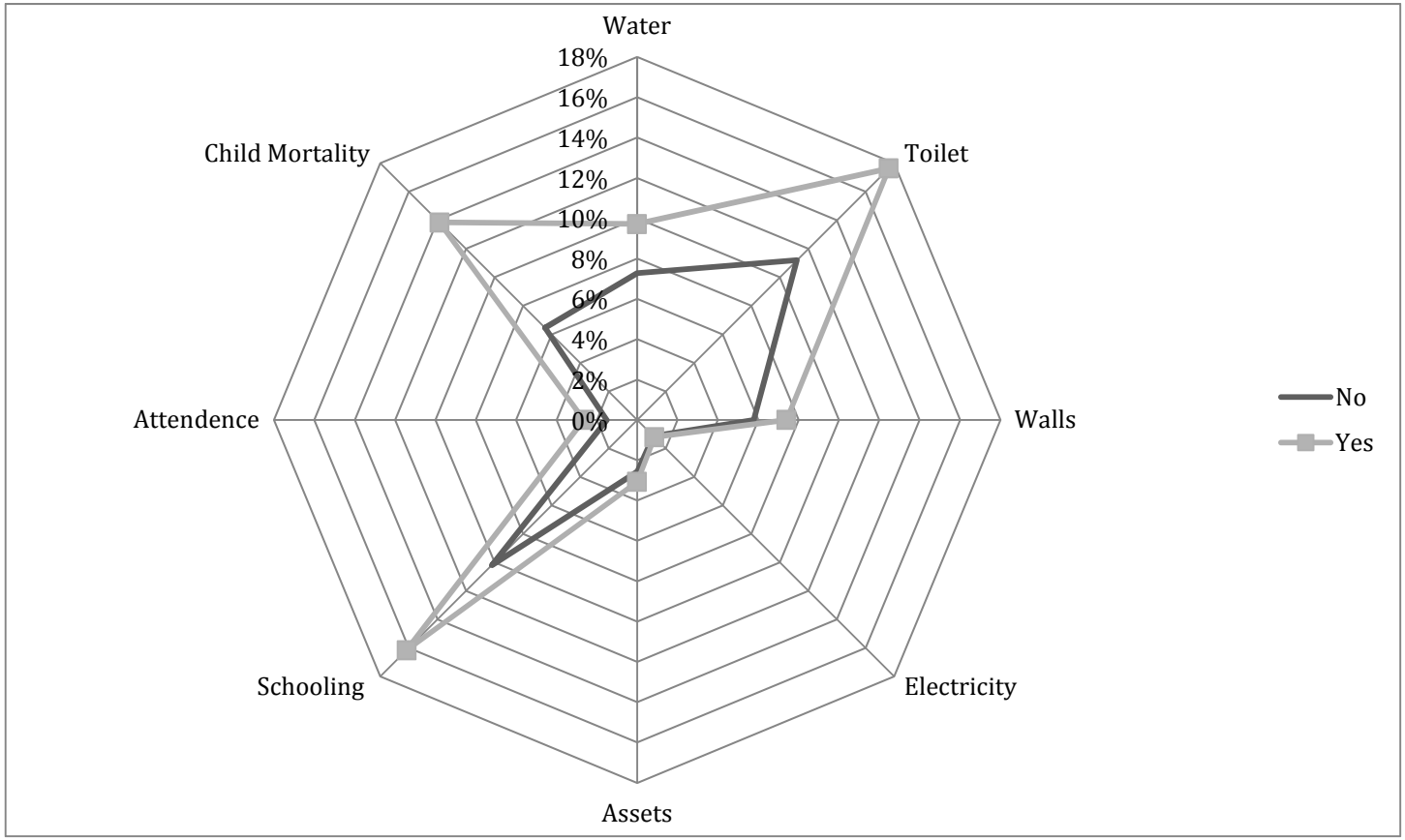
***p-value>0.01; **>0.05; *>0.1

MULTIDIMENSIONAL POVERTY ANALYSIS

TABLE A2. 22. DIMENSIONS, INDICATORS AND WEIGHTS MULTIDIMENSIONAL POVERTY ANALYSIS BRAZIL

Dimension	Indicator	Definition		Weight
Health	Child mortality	Any child has died in the family	Is the result of the question related to ever child alive and current child alive	1/3
Education	Years schooling	In this case if the person has no education or primary incomplete	Deprived if no household members older than 12 that have at least than six years of schooling (primary school)	1/6
	Child school attendance	Any school child who is not assisting to school	If any school child older than 6 younger or equal to 15 is not attending school	1/6
Living Standard	Electricity	If the dwelling has no electricity	Deprived if the household does not have electricity of any source	1/15
	Water	The household does not have access to safe drinking water such as aqueduct	Deprived if the household has access to water by well inside or outside the property, pipe, tank water, river, other sources of water	1/15
	Sanitation	The household sanitation is not improved or in shared with other households	Deprived if: Toilet not connected to a sewage drain or latrine; toilet connected to a septic tank, no sewerage. Also, if the sanitation services are shared with other households	1/15
	Walls material	The household has walls different to brick with and without coating	Walls of wood, mud, straw , other material or without walls	1/15
	Asset ownership	The household does not own more than one assets of the following list: TV, blender, fridge, radio, washing machine PC or car	It is always not deprived if the household has a car	1/15

FIGURE A2. 6. CENSORED HEADCOUNT HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS MULTIDIMENSIONAL POVERTY ANALYSIS BRAZIL



APPENDIX 3

CHILE

SOCIAL PROTECTION SYSTEM

SOCIAL INSURANCE

Chile was classified by Mesa-Lago (1991, 1999, 2000, 2002) as a pioneer country in the development of the Welfare State in LA. The first social security institution was funded during 1920s, and the coverage was expanded to working populations as a result of social pressure for different sectors of civil society (Segura-Ubiergo, 2007). Although, the expansion of social security was fragmented and stratified, it was considered universal and progressive. The pressure of working group populations and the increase on democracy levels were two main reasons for this expansion. However, the structure of the system created inequalities in access to social security (Hojman, 2003). The deterioration of living standards and social indicators was the principal cause of the creation of income taxes, social and labour legislation and that public health became a priority for the State (Illanes and Riesco, 2007).

The change in the macroeconomic development model after the great depression (1930) had an impact on the implementation of social security programmes. After 1930, the priority was to protect national economies and to incentivise the creation of new industries. This increased migration to urban areas and the number of workers in the manufacturing sector, placed a major pressure to extend social security programmes (Illanes and Riesco, 2007). Although the access to

health care increased, problems in supply and quality of services were identified. During 1945-1973, the welfare state in Chile provided limited access to poor and rural populations, which were not involved in working unions and only had access to the public system, which was considered of bad quality (Hojman, 2003).

The democratic and semi-democratic regimes before 1970 were the basis for the development of the welfare state in Chile and the stratified expansion of the social security system (Barrientos et al., 2008). In addition, the increase of social expenditures during the 1960s was another cause of the almost universal coverage of social services such as health and pensions. Indeed, by the early 1970s, around 60% to 70% of the population were covered by the social security system (Huber, 1996). In 1973, social expenditures in Chile were above 20% of the GNP, one of the highest levels in LA (Segura-Ubiergo, 2007).

In October 1973, General Pinochet took power and launched a revolutionary reform. This reform structurally changed economic and social development models, moving from an import and state-oriented system to an export-oriented and open economy. Pinochet appointed a group of Chilean economists known as the "*Chicago Boys*", who proposed a number of reforms based on Neoliberal ideas, with the objective to reduce size and functions of the State and to increase the participation of private sectors in the provision of social services (Hojman, 2003, Huber, 1996, Illanes and Riesco, 2007, Segura-Ubiergo, 2007).

The pension system had the most important reform. Before 1981, the Chilean pension system was composed for more than 30 different PAYGO based occupation retirement plans. High levels of informality and evasion of contributions were the

cause of severe financial problems of the pension system, with a deficit of 2.7% of GDP by 1980 (Kritzer, 2000). After the introduction of the new system, the old system was completely closed and all new workers had the obligation to join the new private system. Workers with less than five years before retirement had the option to switch to the new system or continue with the old one. However, different government incentives were proposed to increase the number of workers moving from public to private system. Those who decided to switch received a government gross wage increase, and the contribution made to the old system were joined to the new system. Moreover, the contribution was reduced from 25.6% in the public to 19.5% in the private system (Huber, 1996, Kritzer, 2000).

The main feature of the new system was the existence of private and individual accounts, which were administrated by private for-profit pension funds (AFP). This system was compulsory for all wage and salary earners and the participation of self-employed was voluntary. At the end of the working life, individuals will receive their contribution and the returns on their investments minus administrative costs after retirement age. The employers do not contribute to the system and the State only contributes in cases where the minimum pension is not guaranteed after 20 years of contributions, and when after a planned withdrawal their funds were exceeded because their life expectancy was longer than expected (Antía and Lanzara, 2011, Brooks, 2009, Huber, 1996, Huber and Stephens, 2000, Kritzer, 2000, Mesa-Lago, 1997).

The new system offered pensions for disabled workers and survivors. The first group receive a pension in the case that they have contributed for two out of five

years before becoming disabled and they have lost at least 50% of their working capacity. A partial disability pension is paid to individuals who have lost between one-half and two–thirds of their working capacity. The final disability pension payable to the person depends on his working capacity loss (total or partial) and if the person was an employee or self-employed. For those who were employees with a total disability, 70% of their salary will be payable, 50% for those with a partial disability. Self-employed keep 50% of their salary when it is a total disability or 35% when it is partial disability (Grushka and Demarco, 2003). A survivor pension depends on the relationship between the person and the deceased and on the contributions the deceased made during the last five years (Kritzer, 2000).

The government regulated the investment AFPs made, but not the fees they charge or commissions they receive. Although the system looked for competition between AFPs, the pension systems is highly concentrated, with almost 70% of the population enrolled in only three AFPs (Huber, 1996, Mesa-Lago, 1997)

The Chilean pension system has one of the highest coverage rates in the region. Nevertheless problems associated with low levels of replacement rates; high levels of unemployment and informality and high administrative cost of AFPs increased the gap and inequalities in the access to the pension system (Antía and Lanzara, 2011). Reforms in 2006 increased coverage for vulnerable populations (young, women and self-employed), and included different incentives to encourage voluntary saving accounts for middle income workers and to increase the levels of competition between AFPs (Antía and Lanzara, 2011).

The reform in health care was implemented in 1979. This reform was not as severe as the one in the pension system; however, it is considered the most radical in the entire region. The health system changed from a mandatory public health insurance to a mixed public-private health system. The option to enrol in a private health plan was related to being enrolled in a private pension fund. Private health companies (ISAPRE *Institutos de salud provisional*) offer different plans which are contracted with private providers. The size of the plan depended on contributions and co-payments that the insured is willing to pay and those plans add a number of services that were not covered in the public system (Huber and Stephens, 2005, Mesa-Lago, 1997).

On the other hand, the public system was decentralized at the regional and municipal level. It had two components at the national level *El Fondo Nacional de Salud* (FONASA) and the *Sistema Nacional de Servicios de Salud* (SNSS) that provide specialized services. At the community level, local municipalities provide primary health care (Mesa-Lago, 2008b). The public system usually offers services to low income populations, who cannot afford the mandatory contribution of 7% and the co-payments to be enrolled in the private system (Mesa-Lago, 2008b).

Although the number of affiliates to the private system increased, inequalities related with income, gender, region, ethnic origin, employment status and access are higher in the private sector (Bertranou, 1999, Huber, 1996, Huber and Stephens, 2005, Mesa-Lago, 1997, 2008a, b, Segura-Ubiergo, 2007).

Differences between private and public health care systems are related to type of services covered and type of providers. In the public system, poor populations do not have to pay and they can choose between a "*free election system*" in which they choose doctors and hospitals or the SNSS. On the other hand, the ISAPRE offers services with private providers and the coverage depends on the co-payment the insured pay. Primary care is not offered for the private system, it is assumed by the public system (Bertranou, 1999, Huber, 1996, Mesa-Lago, 1997, 2000, 2007c, 2008b).

During the 1990s, democratic governments were elected and contrary to expectations did not make severe reforms to health care or pension systems. Instead an emphasis to increase the coverage and reach universality of those services was the priority (Barrientos, 2004, Mesa-Lago, 2008b, Segura-Ubiergo, 2007). In order to reach universality, in 2004, a minimum benefit package in health care was established. This package includes treatments to different chronic conditions that should be provided by the public and the private sectors (Mesa-Lago, 2004).

In conclusion, the Chilean social security system started during the 1920s. It was drastically reformed during the 1970s and as a result it is considered one example for most LA countries. Before the neoliberal reforms, the social security system was fragmented and it did not provide universal access to pensions and health care. After the reforms, the private sector started to play an important role managing the pension system and providing health care services. In the last two

decades, small and partial reforms have included solidarity and equity principles, aiming to increase coverage and reach poor and excluded populations.

SOCIAL ASSISTANCE

The first social assistance programme was implemented in 1975. It was a non-contributory pension, whose main objective was to provide help for poor, old and disabled individuals (Barrientos and Hinojosa-Valencia, 2009, Mesa-Lago, 2008b). During the Pinochet dictatorship different targeting programmes were established with purposes to provide social safety nets and to improve social indicators related to health and nutrition (Illanes and Riesco, 2007). Nevertheless, those programmes were scarce and had a charity role.

After the recovery of democracy in 1989 and during the 1990s, strategies aimed at reducing social debt and to recover levels of social participation were the priority for the government. Only after 2002, an inter-sectorial programme with the purpose to provide support to the poorest families in the country and to ensure access to cash grants and other social programmes was implemented (Ministerio de Planificación (MIDEPLAN), 2009b). *Chile Solidario* is organized around three components: 1) programme of psych-social support to families, 2) monetary subsidies that include single family subsidy, assistance pension for old age; disability assistance pension; drinking water subsidy; grant for school promotion and grant for identity card, and 3) preferential access to social programmes (MIDEPLAN, 2009b).

Chile Solidario is an integrated anti-poverty programme, which is based on the capability approach and it combines different programmes that aim to promote and strengthen several types of capabilities of poor households (Barrientos and Santibañez, 2009a). It has showed a positive impact on school enrolment rates and health indicators.

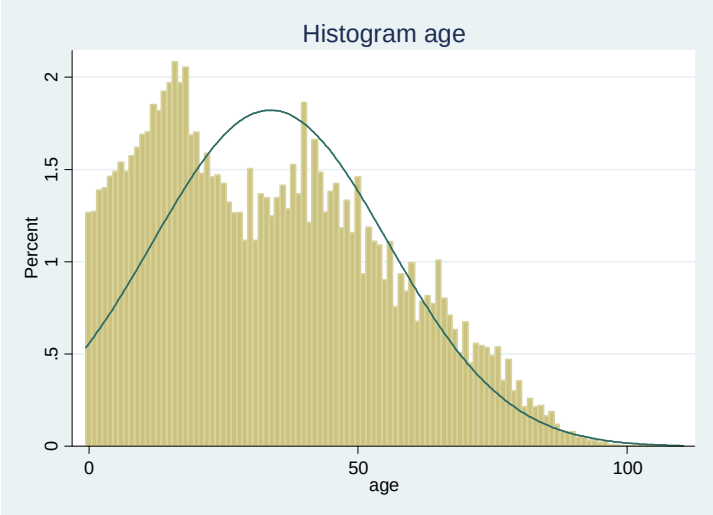
Additionally, the non-contributory pensions have been one strategy to increase access to the pension system to poor populations that did not reach the minimum conditions in the private sector (Antía and Lanzara, 2011, Mesa-Lago, 2007b, 2008b). As a result of the difficulties in access to the pension system for poor individuals, in 2006, a *Solidarity Pension System* was created with the main objective to provide a basic pension to the poorest 60% of the population (older than 65 years), without considering their contribution history (Antía and Lanzara, 2011). In 2008, a non-contributory disability pension (APS-disability) was implemented with a monetary transference equivalent to 65.7% of the monthly pension in the contributory regime.

CHILE CASEN 2006

DESCRIPTIVE STATISTICS

The average age was 33 years, with a maximum age of 110 years old (Figure A3.1). 51.2% of the individuals were females and 87.1% lived in urban areas and 40% of the population lived in the Metropolitan Region.

FIGURE A3. 1. HISTOGRAM AGE CHILE CASEN 2006



Only 3.9% of the population was illiterate and 27% of the population had an education level equal to primary school and 7.4% did not have any level of education. 52.2% of the individuals older than 12 years old did not work the previous week.

The impairments with the highest prevalence were visual (3.1%) and physical impairment (1.8%) (Table A3.1). The average age of people living with any impairment was 51.5 years old with an increase of the prevalence of disability when age increases (Figure A3.2). Additionally, 55% of individuals living with any type of impairment were female. Nevertheless the prevalence of each impairment varies between genders (Table A3.2).

TABLE A3. 1. TYPE OF IMPAIRMENT CHILE CASEN 2006

Type of impairment	Percentage
Visual impairment	0.031
Hearing impairment	0.009
Muteness or speaking impairment	0.002
Physical impairment	0.018
Mental or intellectual illness	0.007
Psychiatric impairment	0.003
No impairment	0.931

FIGURE A3. 2. AGE PEOPLE WITH AND WITHOUT DISABILITY CHILE CASEN 2006

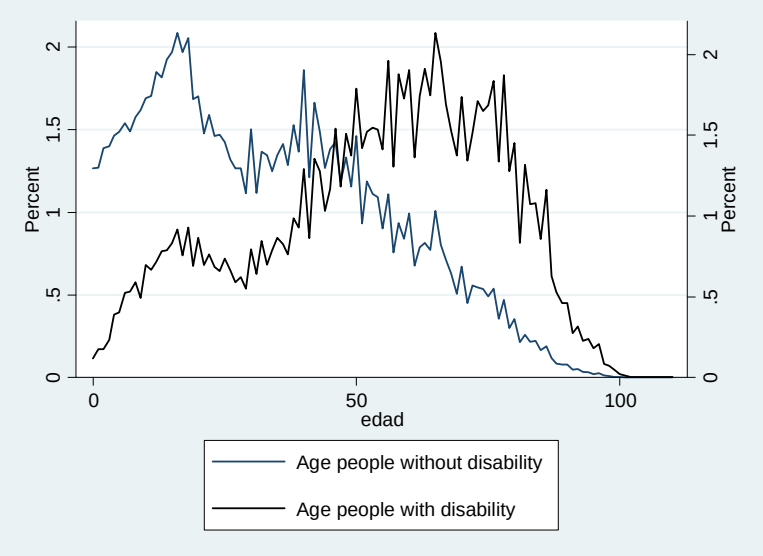
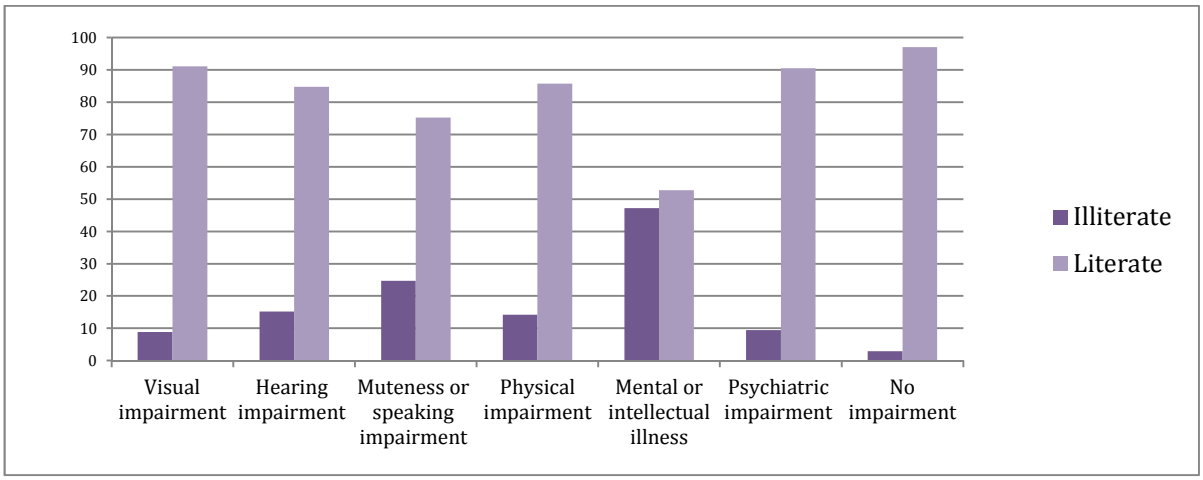


TABLE A3. 2.GENDER AND TYPE OF IMPAIRMENT CHILE CASEN 2006

	Male	Female
Visual impairment	40.36	59.64
Hearing impairment	53.06	46.94
Muteness or speaking impairment	61.67	38.33
Physical impairment	44.71	55.29
Mental or intellectual illness	54.93	45.07
Psychiatric impairment	44.53	55.47
No impairment	49.03	50.97

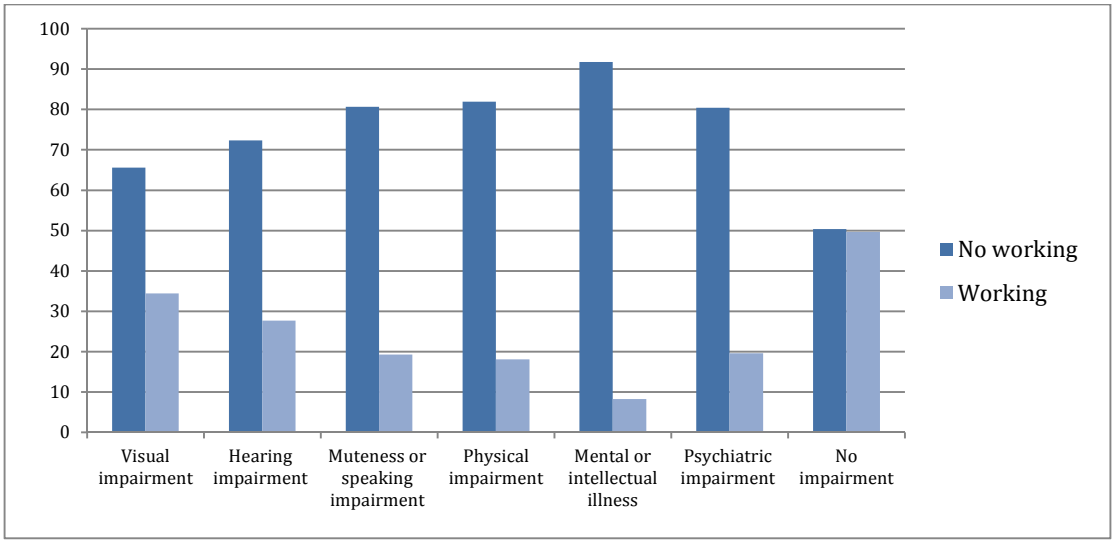
10% of individuals with impairments did not have any type of education and 14% were illiterate. Of those with mental impairment, 47% were illiterate and in most cases, individuals living with an impairment had a lower levels of education and higher illiterate rates compared to individuals without impairments (Figure A3.3).

FIGURE A3. 3. ILLITERATE RATES AND TYPE OF IMPAIRMENT CHILE CASEN 2006



The unemployment rates of individuals with any type of impairment were always higher than individuals without impairments. Indeed, 91.7% of people with mental impairments did not work the week prior to the survey and employment rates were lower than 30% in all cases, except people with visual impairments (Figure A3.4).

FIGURE A3. 4. EMPLOYMENT RATES AND TYPE OF IMPAIRMENT CHILE CASEN 2006



VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLE

1. *Poverty lines*: Chilean National Statistics department produces a national poverty and extreme poverty lines using indirect methods. The line represents the minimum level of income a person needs to satisfy a minimum calorie intake or a basic basket of food.

$$Poverty\ line = (k * Cost\ basic\ basket\ of\ food)$$

Where *k* is a multiplication factor, which is different between urban and rural areas; it took a value of two in urban areas and 1.75 in rural areas. The variable took three values (1= extremely poor; 2= poor; 3= non poor) (Table A3.3).

TABLE A3. 3. POVERTY SITUATION CHILE CASEN 2006

Poverty situation	Percentage
Extremely poor	3.18
Poor	10.49
Non poor	86.33

2. *Poverty*: Using the same information, the variable poor was created; this variable was a transformation of the poverty line, and took the value of one when the person was poor or extremely poor and 0 when s/he was non-poor (Table A3.4).

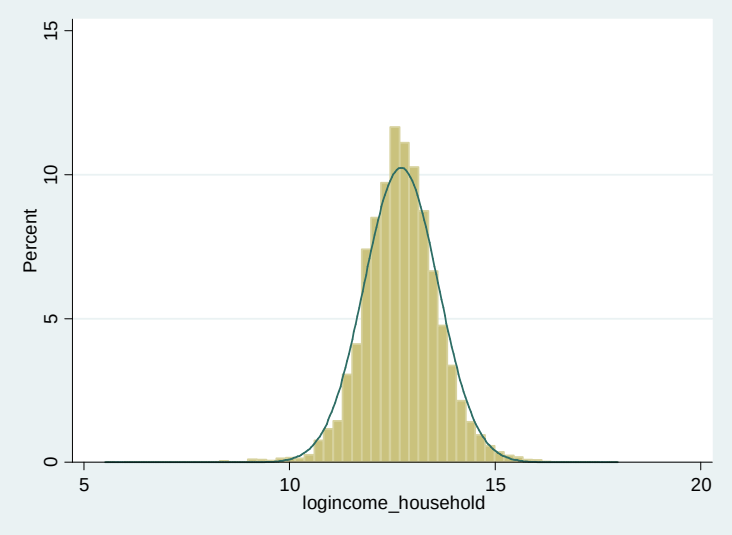
TABLE A3. 4. POOR OR NON-POOR CHILE CASEN 2006

	Percentage
Non-poor	86.33
Poor	13.67

3. *Natural logarithm household income:* This variable was the logarithmic transformation of household income. Variable that was the result of the

sum of: autonomous family income, income transference and imputation of other sources of income (e.g. rent of dwelling). Logarithmic transformations improve the characteristics of distributions, reducing the skewness and the kurtosis. Figure A3.5 presents the distribution of the variable after the logarithmic transformation.

FIGURE A3. 5. HISTOGRAM LOGARITHM HOUSEHOLD INCOME CHILE CASEN 2006



INDEPENDENT VARIABLES:

1. *Household characteristics*:
    a. *Disability household*: Dichotomous variable that represented the presence of at least one member with disability in a household. It was created using the information from the answers of a short questionnaire:

Do you have any of the follow long term conditions?

i. Blindness or visual difficulty even when you use glasses
ii. Deafness or hearing difficulty even when you use hearing aid
iii. Muteness or speaking difficulties
iv. Physical or difficulty to move
v. Mental or intellectual difficulty
vi. Psychic or psychiatric difficulty
vii. No long term difficulty

With the information from this questionnaire, a variable was created. It took the values of one when the person answered yes to any of the options and zero when not. With this information the final variable was created, which represents the existence of at least one member with disability in the household (Table A3. 5).

TABLE A3. 5. DISABILITY IN THE HOUSEHOLD CHILE CASEN 2006

	Percentage
Without members with disability	79.32
With members with disability	20.68

b. *Number of elderly members (older than 65 years old):* Continuous variable that took values between 0 and 4, it included the count of the number of people older than 65 years old.

c. *Number of children (members younger than 12 years old):* Continuous variable that took values between 0 and 4 and represents the number of individuals younger than 12 years per household (Table A3.6).

TABLE A3. 6. NUMBER OF CHILDREN CHILE CASEN 2006

Number children household	**Percentage**
0	39.82
1	31.75
2	19.69
3	6.46
4 or more	2.28

d. *Number of working members per household*: Continuous variable that took values between 0 and 5. It included the count of the number of people who was working and receiving a salary per household (Table A3.7).

TABLE A3. 7. NUMBER OF WORKING MEMBERS CHILE CASEN 2006

Working individuals per household	Percentage
0	8.17
1	37.32
2	34.59
3	13.51
4	4.7
5 or more	1.71

e. *Size of the household:* Continuous variable with values between one and 21. For 2006, the average size of the household was 4.1 members per household.

2. *Area:* Dummy variable which takes the values of one when the person lived in urban areas or zero in rural areas (Table A3.8).

TABLE A3. 8. AREA CHILE CASEN 2006

	Percentage
Rural	12.88
Urban	87.12

3. *Regions*: Dichotomous variables that represented each region in Chile. Each of them took the value of one when the person lived in that region and 0 if not. Arica and Parinacota was the reference variable for the econometric models.

4. *Head of the household characteristics:*

a. *Female head of household*: Dichotomous variable that took the value of one when the person was living in a household, whose head was female and 0 otherwise (Table A3.9).

TABLE A3. 9. SEX HEAD OF THE HOUSEHOLD CHILE CASEN 2006

	Percentage
Male head	73.84
Female head	26.16

b. *Age head of the household*: Continuous variable that represented the age of the head of the household. It took values between 16 and 103 and the average age was 50.2 years.

c. *Age squared head of the household*: Continuous variable that represented the square of the age of the head of the household.

d. *Head level of education*: Dichotomous variables that represented the level of education of the head of household. Each variable took the value of one when the person was living in a household, whose head reported to have that level of education and 0 otherwise (Table A3.10).

TABLE A3. 10. LEVEL OF EDUCATION HEAD OF HOUSEHOLD CHILE CASEN 2006

Level education head	Percentage
High School head	14.51
Basic education	22
Special education	0.04
Humanistic education	7.61
Humanistic/Media education	24.97
Technical education	2.23
Technical/professional	7.73
Technological incomplete	0.41
Technological complete	1.92
Professional incomplete	0.98
Professional complete	3.09
University incomplete	3.12
University complete	7.01
Postgraduate	0.97
No education	3.4

e. *Head working:* Dichotomous variable that took the value of one if the person was living in a household, whose head was working and 0 if not (Table A3.11).

TABLE A3. 11. HEAD OF THE HOUSEHOLD WORKING CHILE CASEN 2006

	Percentage
Head no working	25.7
Head working	74.3

f. *Head of the household with disability*: Dichotomous variable that took the value of one if the person was living in a household, whose head had disability and 0 if not (Table A3.12).

TABLE A3. 12. HEAD OF THE HOUSEHOLD WITH DISABILITY CHILE CASEN 2006

	Percentage
Head without disability	90.4
Head with disability	9.6

5. Dwelling ownership

a. *Own dwelling*: This variable included information about people who owned the dwelling (fully paid or with a mortgage) where they were living and those who owned it and shared it with others.

b. *Rent dwelling:* This variable included information of dwelling or flats rented with or without a contract.

c. *Other types of dwelling*: Included information about dwellings that were given or were inhabited illegally.

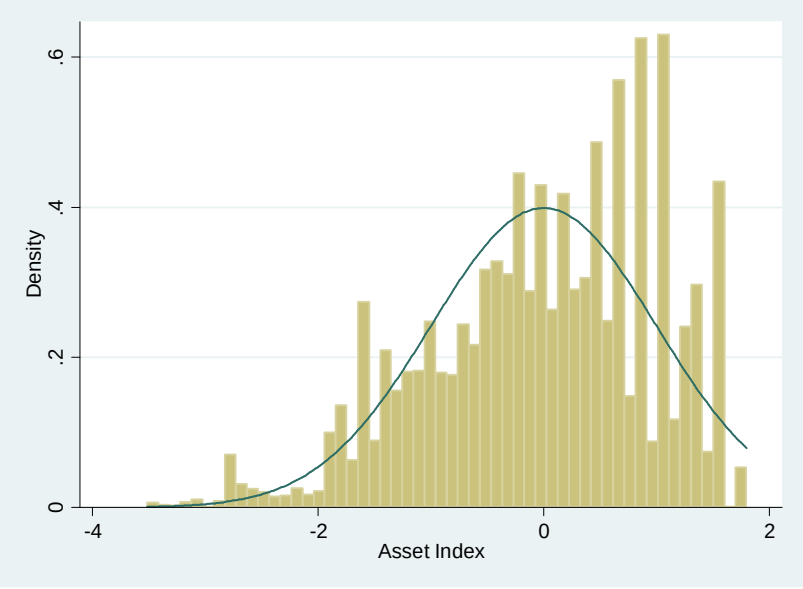
6. *Poorest 40% according to the asset index*: Dichotomous variable that took the value of one if the person lived in the poorest 40% according to the asset index and 0 otherwise.

    a. *Asset index:* The first component explained the variance of the variables by 19%. The results of the first component are presented in table A3.13. The values of the first component were small, but the index increased when the household had better characteristics (brick as the walls material; ceramic as floor material; public sewerage, public source of water and energy). Additionally, the ownership of any asset increased the values of the index. Figure A3.6 presents the distribution of the asset index and Figure A3.7 presents the distribution of the asset index in rural and urban areas.

TABLE A3. 13. FIRST COMPONENT ASSET INDEX CHILE CASEN 2006

	Weight in First component
Washing machine	0.2296
fridge	0.1951
Calefont	0.282
Phone	0.2512
Tv connection	0.197
PC	0.2167
Water: public aqueduct	0.2999
Water: Well	-0.2006
Water: River and other sources	-0.2021
Sewerage: WC connected to public sewerage	0.3052
Sewerage: WC to septic fossa	-0.0791
Sewerage: Latrine	-0.1032
Sewerage: black well	-0.2486
Sewerage: No system	-0.0668
Energy: Public	0.1809
Energy: Own generator	-0.0869
Energy: Other sources	-0.0689
Energy: No energy	-0.1429
Walls: Reinforce concrete	0.0855
Walls: Brick	0.2483
Walls: Septum	-0.2303
Walls: Adobe	-0.0628
Walls: Other material	-0.0579
Floors: Concrete floor	0.2764
Floor: Raider	-0.0521
Floors: Other materials	-0.2212
Floors: earth	-0.1037

FIGURE A3. 6. ASSET INDEX DISTRIBUTION CHILE CASEN 2006

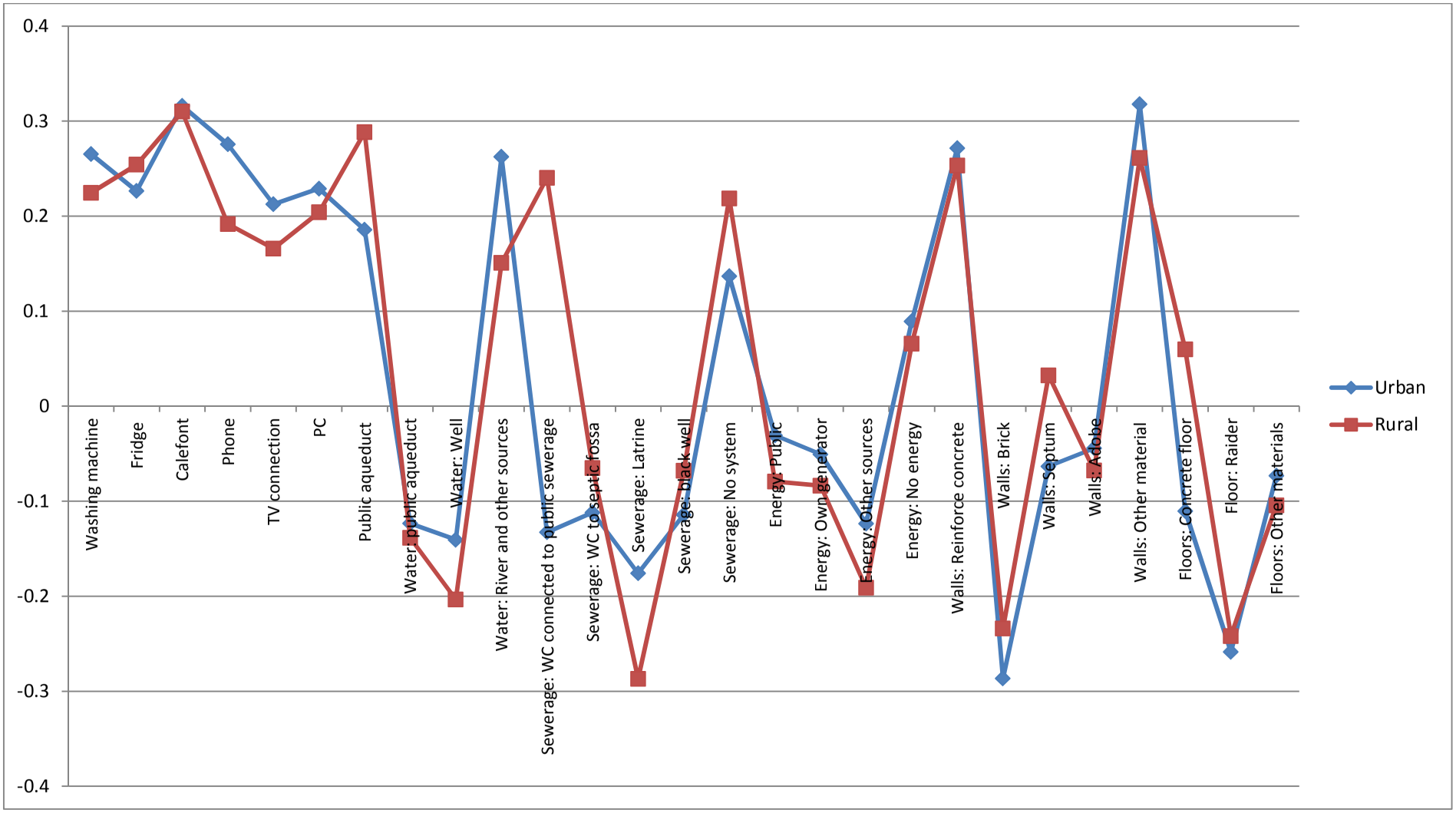


7. *No school attendance:* Dichotomous variable that represented the existence of at least one school age children that did not attend to school (Table A3.14).

TABLE A3. 14. NO SCHOOL ATTENDANCE CHILE CASEN 2006

	Percentage
All children attending to school	95.6
Children no attending to school	4.4

FIGURE A3. 7. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS CHILE CASEN 2006



CROSS-SECTIONAL ANALYSIS

RESULTS MODEL 2A

Regressions

Dependent variable: Natural logarithm of household income

Independent variable: Disability household

TABLE A3. 15. RESULTS MODEL 2A (DEPENDENT VARIABLE: NATURAL LOGARITHM HOUSEHOLD INCOME AND INDEPENDENT VARIABLE: PRESENCE OF AT LEAST ONE MEMBER WITH DISABILITY) CHILE CASEN 2006

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Working household	0.454***	0.429***	0.409***	0.406***	0.405***	0.406***
	(0.00339)	(0.00327)	(0.00316)	(0.00316)	(0.00313)	(0.00312)
Elderly household	0.0922***	0.102***	0.127***	0.123***	0.122***	0.122***
	(0.00497)	(0.00480)	(0.00652)	(0.00652)	(0.00649)	(0.00649)
Children household	-0.0176***	-0.0185***	0.00788**	0.00866***	0.0149***	0.0174***
	(0.00350)	(0.00340)	(0.00320)	(0.00319)	(0.00316)	(0.00317)
Disability household	-0.125***	-0.108***	-0.0470***	-0.0469***	-0.0405***	-0.0386***
	(0.00735)	(0.00714)	(0.00671)	(0.00670)	(0.00665)	(0.00664)
Urban		0.204***	0.0703***	0.0507***	-0.0550***	-0.0563***
		(0.00648)	(0.00616)	(0.00631)	(0.00698)	(0.00698)
Tarapaca		0.0648*	0.0607*	0.0394	0.0199	0.0204
		(0.0354)	(0.0343)	(0.0343)	(0.0343)	(0.0343)
Antofogasta		0.387***	0.322***	0.314***	0.247***	0.248***
		(0.0336)	(0.0325)	(0.0325)	(0.0326)	(0.0327)
Atacama		0.304***	0.284***	0.271***	0.226***	0.228***
		(0.0327)	(0.0315)	(0.0315)	(0.0317)	(0.0318)
Coquimbo		-0.0260	0.000562	-0.0217	-0.0742**	-0.0728**
		(0.0304)	(0.0292)	(0.0292)	(0.0295)	(0.0295)

Valparaiso	0.0402	0.0231	0.0119	-0.0329	-0.0317
	(0.0288)	(0.0278)	(0.0277)	(0.0280)	(0.0281)
Libertador	-0.0273	0.0277	0.0147	-0.0428	-0.0419
	(0.0287)	(0.0277)	(0.0277)	(0.0280)	(0.0281)
Maule	-0.112***	-0.0597**	-0.0717**	-0.119***	-0.118***
	(0.0291)	(0.0281)	(0.0281)	(0.0284)	(0.0284)
Bio Bio	-0.113***	-0.0938***	-0.108***	-0.114***	-0.113***
	(0.0284)	(0.0275)	(0.0274)	(0.0277)	(0.0278)
Araucania	-0.170***	-0.133***	-0.151***	-0.138***	-0.136***
	(0.0292)	(0.0281)	(0.0281)	(0.0283)	(0.0284)
Los Rios	-0.0364	-0.0107	-0.0174	0.000477	0.00280
	(0.0314)	(0.0300)	(0.0299)	(0.0301)	(0.0302)
Los Lagos	0.165***	0.196***	0.180***	0.196***	0.199***
	(0.0291)	(0.0282)	(0.0281)	(0.0284)	(0.0284)
Aysen	0.315***	0.311***	0.289***	0.232***	0.233***
	(0.0375)	(0.0351)	(0.0350)	(0.0354)	(0.0354)
Magallanes	0.421***	0.338***	0.331***	0.274***	0.275***
	(0.0371)	(0.0350)	(0.0350)	(0.0353)	(0.0353)
Metropolitan Region	0.229***	0.155***	0.144***	0.0852***	0.0868***
	(0.0285)	(0.0274)	(0.0273)	(0.0277)	(0.0278)
High school head		0.151***	0.150***	0.128***	0.126***
		(0.0110)	(0.0110)	(0.0110)	(0.0110)
Basic Education Head		0.141***	0.144***	0.121***	0.121***
		(0.0119)	(0.0119)	(0.0119)	(0.0118)
Special education head		0.290**	0.282**	0.277**	0.271**
		(0.137)	(0.133)	(0.125)	(0.125)
Humanistic education head		0.438***	0.438***	0.381***	0.377***
		(0.0123)	(0.0123)	(0.0123)	(0.0123)
Technical education head		0.641***	0.638***	0.570***	0.565***
		(0.0150)	(0.0150)	(0.0150)	(0.0150)
Professional education head		1.028***	1.023***	0.940***	0.934***
		(0.0233)	(0.0231)	(0.0231)	(0.0231)
University education head		1.344***	1.334***	1.248***	1.243***
		(0.0184)	(0.0183)	(0.0184)	(0.0184)
Graduate education head		1.851***	1.836***	1.747***	1.742***

			(0.0517)	(0.0513)	(0.0516)	(0.0516)
Age head square			-0.000118***	-0.000102***	-9.48e-05***	-9.65e-05***
			(1.10e-05)	(1.11e-05)	(1.11e-05)	(1.11e-05)
Age head			0.0199***	0.0174***	0.0166***	0.0167***
			(0.00116)	(0.00118)	(0.00117)	(0.00117)
Female head			-0.140***	-0.140***	-0.139***	-0.139***
			(0.00681)	(0.00679)	(0.00673)	(0.00672)
Head working			0.103***	0.107***	0.101***	0.0996***
			(0.00899)	(0.00898)	(0.00890)	(0.00890)
Own dwelling				0.130***	0.0933***	0.0930***
				(0.00671)	(0.00673)	(0.00672)
Rent dwelling				0.115***	0.0901***	0.0898***
				(0.0102)	(0.0101)	(0.0101)
Poorest 40					-0.245***	-0.242***
					(0.00697)	(0.00697)
No school attendance						-0.0940***
						(0.0138)
Constant	11.99***	11.86***	10.85***	10.86***	11.14***	11.14***
	(0.00765)	(0.0283)	(0.0427)	(0.0431)	(0.0439)	(0.0439)
Observations	262,807	262,807	262,807	262,807	262,807	262,807
R-squared	0.276	0.328	0.460	0.463	0.473	0.474

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

RESULTS MODEL 2B

Regressions

Dependent variable: Natural logarithm of household income

Independent variable: Head with disability

TABLE A3. 16. RESULTS MODEL 2B (DEPENDENT VARIABLE: NATURAL LOGARITHM HOUSEHOLD INCOME AND INDEPENDENT VARIABLE: HEAD OF HOUSEHOLD WITH DISABILITY) CHILE CASEN 2006

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Working household	0.456***	0.430***	0.409***	0.406***	0.404***	0.405***
	(0.00340)	(0.00327)	(0.00316)	(0.00316)	(0.00313)	(0.00312)
Elderly household	0.0729***	0.0856***	0.122***	0.118***	0.118***	0.118***
	(0.00484)	(0.00468)	(0.00651)	(0.00651)	(0.00649)	(0.00649)
Children household	-0.0164***	-0.0174***	0.00749**	0.00827***	0.0145***	0.0171***
	(0.00351)	(0.00340)	(0.00320)	(0.00319)	(0.00317)	(0.00317)
Urban		0.205***	0.0706***	0.0509***	-0.0551***	-0.0564***
		(0.00649)	(0.00616)	(0.00631)	(0.00698)	(0.00698)
Tarapaca		0.0501	0.0616*	0.0403	0.0214	0.0223
		(0.0354)	(0.0343)	(0.0343)	(0.0343)	(0.0344)
Antofogasta		0.378***	0.324***	0.315***	0.248***	0.250***
		(0.0336)	(0.0326)	(0.0325)	(0.0327)	(0.0327)
Atacama		0.305***	0.285***	0.273***	0.227***	0.229***
		(0.0327)	(0.0315)	(0.0315)	(0.0318)	(0.0318)
Coquimbo		-0.0289	0.00178	-0.0204	-0.0731**	-0.0716**
		(0.0304)	(0.0292)	(0.0292)	(0.0295)	(0.0296)
Valparaiso		0.0353	0.0240	0.0128	-0.0320	-0.0307
		(0.0289)	(0.0278)	(0.0277)	(0.0280)	(0.0281)
Libertador		-0.0308	0.0285	0.0155	-0.0421	-0.0411
		(0.0288)	(0.0278)	(0.0277)	(0.0281)	(0.0281)
Maule		-0.124***	-0.0582**	-0.0702**	-0.117***	-0.116***
		(0.0291)	(0.0281)	(0.0281)	(0.0284)	(0.0285)

Bio Bio	-0.124***	-0.0936***	-0.107***	-0.114***	-0.112***
	(0.0285)	(0.0275)	(0.0275)	(0.0277)	(0.0278)
Araucania	-0.181***	-0.132***	-0.150***	-0.136***	-0.134***
	(0.0292)	(0.0282)	(0.0281)	(0.0284)	(0.0284)
Los Rios	-0.0415	-0.00998	-0.0167	0.00145	0.00393
	(0.0315)	(0.0300)	(0.0300)	(0.0302)	(0.0302)
Los Lagos	0.160***	0.196***	0.180***	0.197***	0.200***
	(0.0291)	(0.0282)	(0.0281)	(0.0284)	(0.0285)
Aysen	0.305***	0.313***	0.291***	0.233***	0.235***
	(0.0375)	(0.0352)	(0.0351)	(0.0354)	(0.0354)
Magallanes	0.418***	0.340***	0.334***	0.276***	0.277***
	(0.0372)	(0.0351)	(0.0351)	(0.0353)	(0.0354)
Metropolitan Region	0.222***	0.156***	0.144***	0.0860***	0.0878***
	(0.0286)	(0.0274)	(0.0274)	(0.0277)	(0.0278)
High school head		0.152***	0.151***	0.129***	0.126***
		(0.0110)	(0.0110)	(0.0110)	(0.0109)
Basic Education Head		0.141***	0.144***	0.122***	0.121***
		(0.0119)	(0.0118)	(0.0118)	(0.0118)
Special education head		0.296**	0.288**	0.283**	0.276**
		(0.137)	(0.133)	(0.124)	(0.124)
Humanistic education head		0.439***	0.439***	0.382***	0.378***
		(0.0123)	(0.0122)	(0.0123)	(0.0123)
Technical education head		0.643***	0.639***	0.571***	0.565***
		(0.0150)	(0.0150)	(0.0150)	(0.0150)
Professional education head		1.031***	1.025***	0.941***	0.935***
		(0.0233)	(0.0231)	(0.0231)	(0.0231)
University education head		1.347***	1.337***	1.249***	1.244***
		(0.0184)	(0.0183)	(0.0184)	(0.0184)
Graduate education head		1.855***	1.839***	1.750***	1.744***
		(0.0516)	(0.0512)	(0.0514)	(0.0515)
Head disability		-0.0728***	-0.0726***	-0.0706***	-0.0709***
		(0.00907)	(0.00905)	(0.00898)	(0.00898)
Age head square		-0.000111***	-9.48e-05***	-8.84e-05***	-9.02e-05***
		(1.10e-05)	(1.12e-05)	(1.11e-05)	(1.11e-05)
Age head		0.0193***	0.0168***	0.0161***	0.0162***

			(0.00116)	(0.00118)	(0.00117)	(0.00117)
Female head			-0.141***	-0.140***	-0.140***	-0.139***
			(0.00681)	(0.00679)	(0.00673)	(0.00672)
Head working			0.0995***	0.103***	0.0976***	0.0958***
			(0.00904)	(0.00902)	(0.00895)	(0.00894)
Own dwelling				0.130***	0.0931***	0.0928***
				(0.00671)	(0.00673)	(0.00672)
Rent dwelling				0.116***	0.0903***	0.0899***
				(0.0102)	(0.0101)	(0.0101)
Poorest 40					-0.245***	-0.243***
					(0.00697)	(0.00697)
No school attendance						-0.0969***
						(0.0138)
Constant	11.97***	11.85***	10.86***	10.87***	11.15***	11.15***
	(0.00750)	(0.0283)	(0.0427)	(0.0432)	(0.0439)	(0.0440)
Observations	262,807	262,807	262,807	262,807	262,807	262,807
R-squared	0.273	0.326	0.460	0.463	0.474	0.474

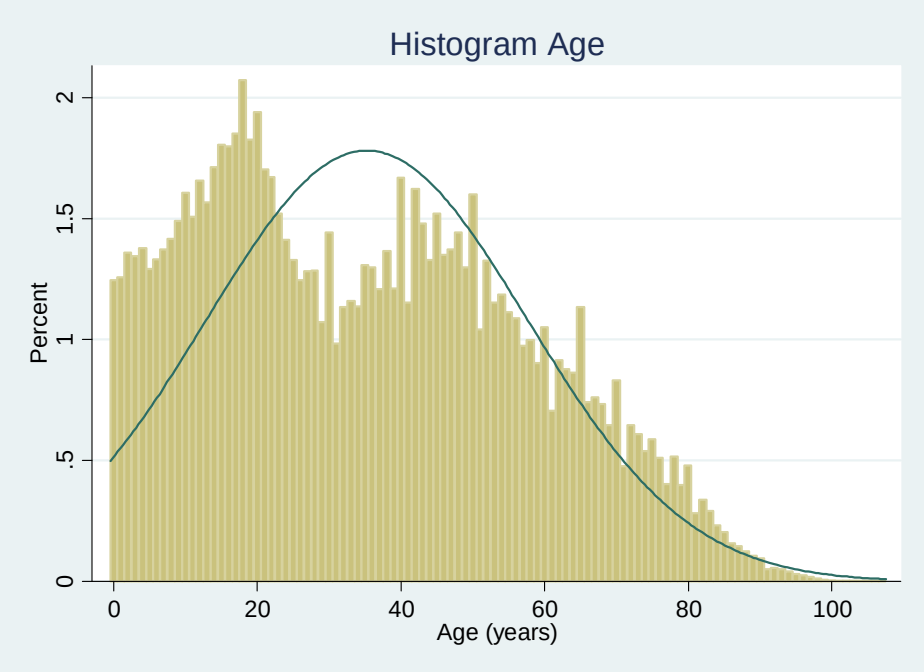
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

CHILE CASEN 2009

DESCRIPTIVE STATISTICS

For 2009 the average age was 34.3 years old, with a maximum value of 108. Figure A3.8 presents the distribution of age in the sample. 51.8% of individuals in the sample were female. The region with the highest percentage of population was the Metropolitan Region (41.5%) and 87% of the population were living in urban areas.

FIGURE A3. 8. HISTOGRAM AGE CHILE CASEN 2009



The average level of education was complete media humanistic. 2.7% of the population did not have any type of education and around 10% had university or more. Information on education was only asked to individuals older than 13 years (Table A3.17).

TABLE A3. 17. EDUCATION LEVEL CHILE CASEN 2009

Education Level	Percentage
No education	2.75
Basic incomplete	11.24
Basic complete	8.54
Media humanistic incomplete	11.98
Media technical incomplete	2.81
Media humanistic complete	17.25
Media technical complete	6.09
Technic or university incomplete	7.74
Technic or university complete	9.72
Younger than 15 years	21.89

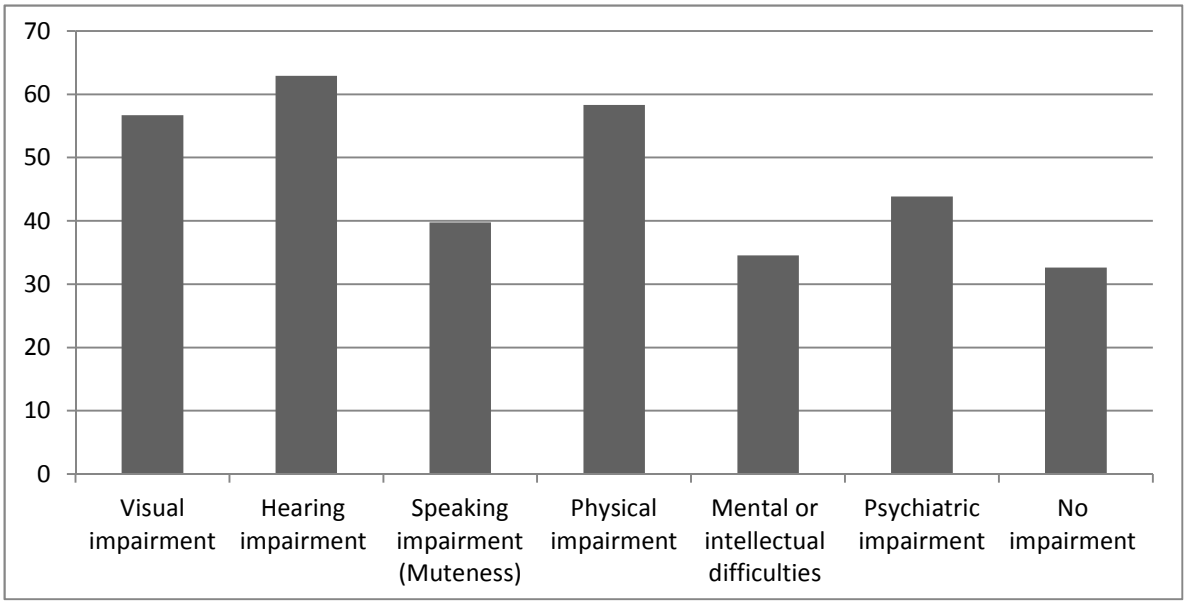
7.6% of the population in Chile were living with any type of impairment. Physical and visual impairments were the ones with the highest prevalence (Table A3.18), and speaking impairments was the less prevalent.

TABLE A3. 18. TYPE OF IMPAIRMENT CHILE CASEN 2009

Type of impairment	Percentage
Visual impairment	2.78
Hearing impairment	0.89
Speaking impairment (Muteness)	0.24
Physical impairment	2.63
Mental or intellectual difficulties	0.65
Psychiatric impairment	0.36
No impairment	92.44

The average age of people with any type of impairment was 55 years old. Individuals with hearing impairments had the highest average age (63 years old) and people with mental or intellectual difficulties the lowest (34.5 years old) (Figure A3.9). 55% of individuals with any type of impairment were female and only in the cases of speaking impairment and mental or intellectual difficulties, the prevalence of impairments were higher for females than males.

FIGURE A3. 9. AVERAGE AGE AND TYPE OF IMPAIRMENT CHILE CASEN 2009



14.3% of people with any type of impairment were illiterate, a percentage that increased when individuals had mental or intellectual difficulties (43.4%) or had a speaking impairment. For all types of impairments, the percentage of individuals without education was higher than for individuals without impairments. 76.3% of individuals with any type of impairment did not have a job the week prior to the interview. The highest unemployment rate was for people with mental or intellectual difficulties (89.4%), followed by physical impairment (82.4%) (Table A3.19).

TABLE A3. 19. EMPLOYMENT STATUS AND TYPE OF IMPAIRMENT CHILE CASEN 2009

	Unemployed	**Employed**
Visual impairment	67.62	32.38
Hearing impairment	75.42	24.58
Speaking impairment (Muteness)	79.88	20.12
Physical impairment	82.44	17.56
Mental or intellectual difficulties	89.37	10.63
Psychiatric impairment	77.63	22.37
No impairment	50.71	49.29

VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLE

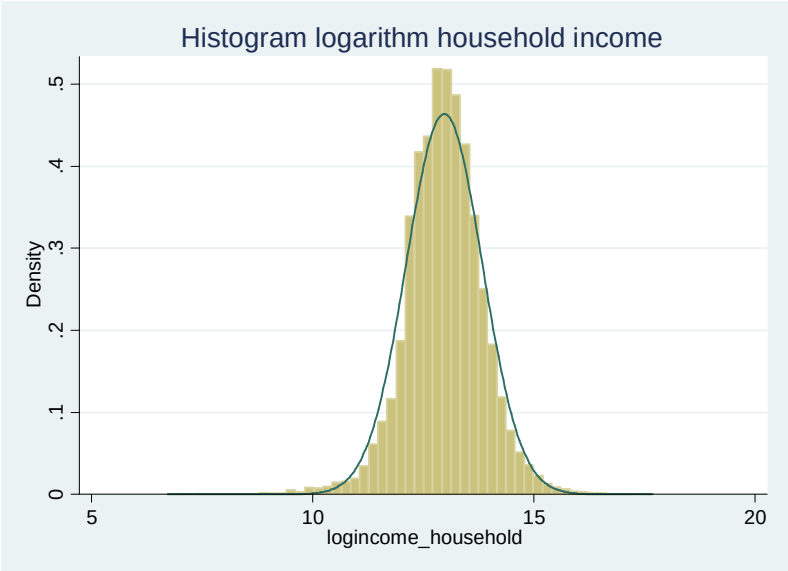
1. *National measure of poverty:* Chile uses a basic basket poverty line; as in the previous year, the national poverty line of Chile was created using indirect methods and determines the minimum income that a household needs to buy a basic food basket in rural and urban areas. Each year a different value of the food basket is established and using information collected from the CASEN, households are classified in three groups: extra poor, poor and non-poor (Table A3.20).

TABLE A3. 20. NATIONAL POVERTY MEASURE CHILE CASEN 2009

	Percentage
Extremly poor	3.7
Poor	11.34
Non poor	84.96

2. *Logarithm household income*: Continuous variable that is the logarithmic transformation of the total household income. Figure A3.10 presents the histogram of the logarithm of household income.

FIGURE A3. 10. HISTOGRAM LOGARITHM HOUSEHOLD INCOME CHILE CASEN 2009



INDEPENDENT VARIABLES

1. *Household characteristics*

   a. *Disability in the household:* Dichotomous variable with value equal to one when the person was living in a household with at least one person with a disability (Table A3. 21).

TABLE A3. 21. DISABILITY IN THE HOUSEHOLD CHILE CASEN 2009

	Percentage
No disabled members in the household	76.15
Disabled members in the household	23.85

   b. *Number of elderly members (older than 65 years old)*: Continuous variable with values between 0 and 2 (Table A3.22).

TABLE A3. 22. ELDERLY IN THE HOUSEHOLD CHILE CASEN 2009

Elderly in the household	**Percentage**
0	76.05
1	16.85
2 or more	7.1

c. *Number of children in the household:* Continuous variable with values between 0 and 4. It represented the number of children per household (Table A3.23).

TABLE A3. 23. CHILDREN IN THE HOUSEHOLD CHILE CASEN 2009

Number children household	Percentage
0	43.42
1	30.06
2	18.55
3	5.86
4 or more	2.11

d. *Number of working individuals per household:* Continuous variable with values between 0 and 4. It identified the number of working age individuals, working and earning a salary in the household (Table A3.24).

TABLE A3. 24. WORKING INDIVIDUALS CHILE CASEN 2009

Number working individuals	Percentage
0	13.52
1	42.13
2	29.68
3	10.16
4 or more	4.52

e. Size of household: Continuous variable that represented the total size of the household. It took values between one and 16, with an average of 4.4 members per household.

2. *Area:* Dichotomous variable, which takes the value of one when the person lived in urban areas and 0 when they lived in a rural area.

3. *Regions:* Dichotomous variables that represented each of the regions in Chile. Each of them took the value of one when the person lived in that

region and 0 if not. Arica and Parinacota was the reference variable in the econometric models.

4. *Household head characteristics*:

   a. *Age head of the household:* continuous variable that took values between 17 and 103. It represented the age of the head of the household. The average age for 2009 was 51.2 years.

   b. *Age squared:* Continuous variable that took values between 289 and 10609.

   c. *Sex head of the household*: Dichotomous variable that took value of one if the head of the household was female and 0 if was a male. 70.5% of the population lives in households with a male head (Table A2.25).

   TABLE A3. 25. SEX HEAD OF THE HOUSEHOLD CHILE CASEN 2009

	Percentage
Male head	70.5
Female head	29.5

   d. Level of education of head household: Dichotomous variable that represented the level of education of the head of the household. Each variable took the value of one if the person was living in a household, whose head had that level of education and 0 otherwise. 14% of the population lived in households in which the head had only completed basic education; around 4% lived in households whose head had no education and 14.2% lived in households with heads who had completed university (Table A3.26).

TABLE A3. 26. LEVEL OF EDUCATION HEAD OF HOUSEHOLD CHILE CASEN 2009

Education level head household	Percentage
No education	3.89
Basic incomplete	19.44
Basic complete	14.36
Media humanistic incomplete	13.48
Media technological incomplete	2.37
Media humanistic complete	20.64
Media technological complete	6.96
Technical or university incomplete	4.61
Technical or university complete	14.25

e. *Head of the household with disability:* Dichotomous variable with value equal to one when the person was living in a household, whose head was living with disability (Table A3.27).

TABLE A3. 27. HEAD OF THE HOUSEHOLD WITH DISABILITY CHILE CASEN 2009

	Percentage
Households without head with disability	89.45
Household with head with disability	10.55

f. *Working head of the household:* Dichotomous variable with value equal to one when the person was living in a household, whose head was working and earning a salary (Table A3.28).

TABLE A3. 28. WORKING HEAD OF THE HOUSEHOLD CHILE CASEN 2009

	Percentage
Head no working	29.52
Head working	70.48

3. *Type of ownership of the dwelling*

   a. *Own the property:* Dichotomous variable that took the value of one if the family owned the house where they were living and 0 if not. It included the options of own house; own and paying a mortgage and owns and shares the house.

   b. *Rent the property*: Dichotomous variable that took the value of one if the family lived in a rented house or a flat and 0 otherwise.

c. *Other:* This variable included all other options of ownership the dwelling. It took the value of one if the dwelling, where the family lived was occupied under these conditions and 0 if not.

4. *Poorest 40% according to the asset index*: Dichotomous variable that took the value of one if the person lived in the poorest 40% according to the asset index and 0 otherwise.

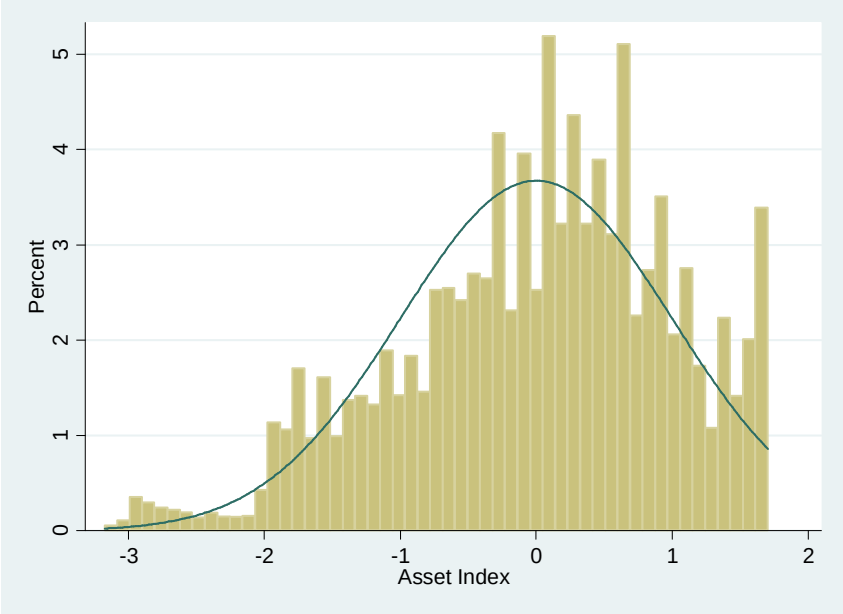
    a. *Asset Index*: The first component explained the variance of the variables by 15.3%. Table A3.29 presents the values of the first component. Although, the values were not large, it is evident that the index increased when the household had better characteristics (walls material: bricks; floor materials: concrete; public aqueduct; public source of energy and public rubbish collection). In addition, when the household has any asset the index increased. Figure A3.11 presents the distribution of the asset index and figure A3.12 presents the contribution of each variable to the asset index in rural and urban areas.

TABLE A3. 29. VALUES FIRST COMPONENT ASSET INDEX CHILE CASEN 2009

Variable	Comp1
Washing machine	0.22
Fridge	0.16
Calefont	0.27
Pone	0.24
TV connection	0.20
Car	0.12
PC	0.23
Internet connection	0.22
Source water: Public aqueduct	0.30
Source water: Public aqueduct no connection	-0.09
Source water: Well	-0.19
Source water: River or other	-0.17

Source water: Trunk	-0.08
Sewerage: Public	0.30
Sewerage: Fosse	-0.11
Sewerage: Latrine	-0.12
Sewerage: Black hole	-0.22
Sewerage: No system	-0.08
Energy: Public source	0.18
Energy: Public without meter	-0.10
Energy: own generator	-0.09
Energy: Other sources	-0.06
No energy source	-0.11
Walls: Steel	0.09
Walls: Brick	0.22
Walls: Lined septum	-0.16
Walls: Adobe	-0.06
Walls: Septum	-0.13
Walls: Other	-0.02
Floors: Concrete with other	0.27
Floor: Concrete without	-0.07
Floor: others	-0.18
Floor: Wood	-0.09
Floor: Earth	-0.09

FIGURE A3. 11. ASSET INDEX DISTRIBUTION CHILE CASEN 2009



5. *No school attendance:* Dichotomous variable that represented the existence of at least one child of school age that was not attending school (Table A2. 30).

TABLE A3. 30. NO SCHOOL ATTENDANCE CHILE CASEN 2009

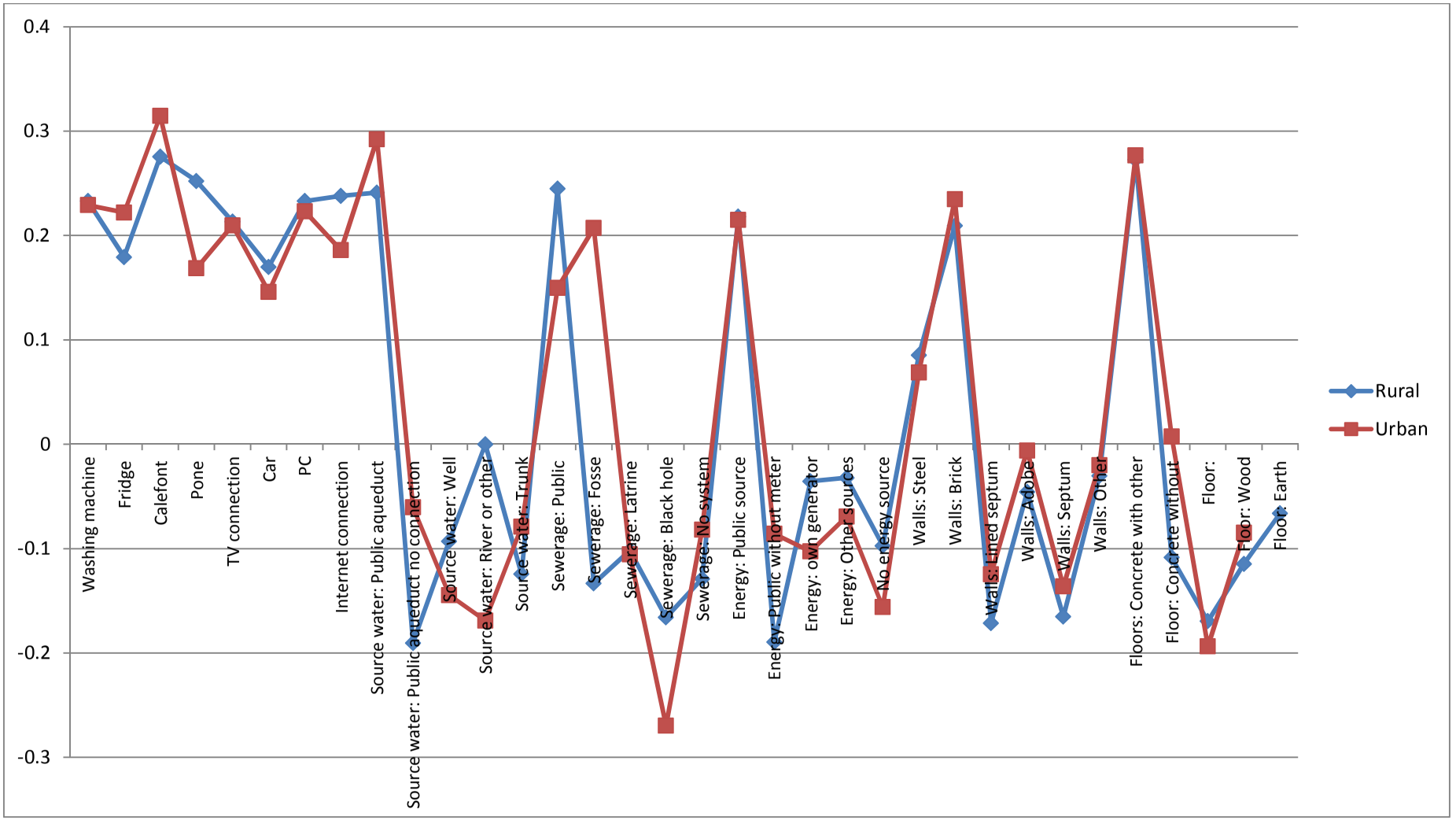
	Percentage
All children attending to school	96.63
Children no attending to school	3.37

6. *Chile Solidario*: Dichotomous variable with values equal to one if the person lived in a household that received a Chile Solidario subsidy and 0 otherwise (Table A3.31).

TABLE A3. 31. CHILE SOLIDARIO CHILE CASEN 2009

	Percentage
No Chile Solidario subsidy	93.16
Chile Solidario Subsidy	6.84

FIGURE A3. 12. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS CHILE CASEN 2009



CROSS-SECTIONAL ANALYSIS

RESULTS MODEL 1A

Marginal effects generalize ordinal logit

Dependent variable: Situation of poverty (three categories).

Independent variable: Disability household

TABLE A3. 32. RESULTS MODEL 1A (DEPENDENT VARIABLE: SITUATION OF POVERTY AND INDEPENDENT VARIABLE: PRESENCE OF AT LEAST ONE MEMBER WITH DISABILITY) CHILE CASEN 2009

	Extremely poor	Poor	No poor
Elderly household	-0.024***	-0.045***	0.069***
Children household	0.001***	0.002***	-0.004***
Disability household	-0.014***	-0.001***	0.015***
Working household	-0.060***	-0.113***	0.173***
Size household	0.013***	0.045***	-0.058***
Urban	0.029****	0.116*	-0.144**
Tarapaca	-0.006***	-0.011***	0.017**
Antofagasta	-0.033***	-0.062***	0.095**
Atacama	0.007***	-0.040***	0.033**
Coquimbo	0.010***	0.019***	-0.029**
Valparaiso	-0.004***	-0.008***	0.012**
Libertador Bernardo	0.004***	0.008***	-0.013**
Maule	0.020***	0.038***	-0.058**
Bío Bío	0.011***	0.032***	-0.043**
Araucanía	0.025***	0.047***	-0.072**
Los Lagos	-0.011***	-0.020**	0.031**
Aysen	0.013***	-0.016**	0.002**

Magallanes	0.013***	-0.028***	0.015**
Metropolitan Region	0.000***	0.000***	0.000**
Los Rios	0.008***	0.015***	-0.022***
Female head	0.007***	0.033***	-0.040***
Age head	0.001***	-0.001***	0.000***
Age head square	0.000***	0.000***	0.000***
Basic incomplete head	-0.007***	-0.013***	0.019***
Basic complete head	-0.014***	-0.026***	0.040***
Media humanistic incomplete head	-0.018***	-0.033***	0.051**
Media technical incomplete head	-0.024***	-0.045***	0.068**
Media humanistic complete head	-0.031***	-0.057***	0.088**
Media technical complete head	-0.042***	-0.078***	0.120***
Technological/university incomplete head	-0.037***	-0.117***	0.154***
Technological/university complete head	-0.051***	-0.148***	0.199***
Head working	-0.025***	0.011***	0.014***
Poorest 40%	0.013***	0.039***	-0.051***
Own dwelling	-0.018***	-0.033***	0.051***
Rent dwelling	-0.007***	-0.013***	0.020***
No school attendance	0.015***	0.008***	-0.023***
Chile Solidario	0.012***	0.022***	-0.034***

*** p<0.01, ** p<0.05, * p<0.1

RESULTS MODEL 1B

Marginal effects generalize ordinal logit.

Dependent variable: Situation of poverty (three categories).

Independent variable: Head of the household with disability

TABLE A3. 33. RESULTS MODEL 1B (DEPENDENT VARIABLE: SITUATION OF POVERTY AND INDEPENDENT VARIABLE: HEAD OF THE HOUSEHOLD WITH DISABILITY) CHILE CASEN 2009

	Extremely poor	Poor	No poor
Elderly household	-0.028***	-0.041***	0.070***
Children household	0.002***	0.003***	-0.004***
Working household	-0.058***	-0.115***	0.173***
Size household	0.013***	0.045***	-0.057***
Urban	0.027***	0.117***	-0.145***
Tarapaca	-0.006**	-0.012**	0.018**
Antofagasta	-0.044***	-0.047**	0.091**
Atacama	-0.002***	-0.027**	0.029**
Coquimbo	0.005***	0.027**	-0.032**
Valparaiso	-0.016***	0.008**	0.007**
Libertador Bernardo	-0.008***	0.025**	-0.018**
Maule	0.010***	0.051**	-0.062**
Bío Bío	0.003***	0.042**	-0.046**
Araucanía	0.018***	0.057**	-0.075**
Los Lagos	-0.021***	-0.005**	0.027**
Aysen	0.006***	-0.005**	-0.001**
Magallanes	0.006**	-0.019**	0.012**
Metropolitan Region	-0.004***	0.006**	-0.002**
Los Rios	0.001***	0.025**	-0.025**
Female head	0.006***	0.033***	-0.040***
Age head	0.001***	0.000***	0.000***

Age head square	0.000***	0.000***	0.000***
Head disability	-0.012***	0.002***	0.010***
Basic incomplete head	-0.005***	-0.015***	0.020***
Basic complete head	-0.012***	-0.029***	0.041***
Media humanistic incomplete head	-0.013***	-0.040***	0.053***
Media technical incomplete head	-0.016***	-0.056***	0.073***
Media humanistic complete head	-0.026***	-0.064***	0.090***
Media technical complete head	-0.036***	-0.085***	0.122***
Technological/university incomplete head	-0.034***	-0.121***	0.155***
Technological/university complete head	-0.047***	-0.153***	0.200***
Head working	-0.027***	0.014***	0.013***
Poorest 40	0.013***	0.037***	-0.051***
Own dwelling	-0.018***	-0.032***	0.050***
Rent dwelling	-0.005***	-0.016***	0.021***
No school attendance	0.015***	0.007***	-0.022***
Chile Solidario	0.011***	0.023***	-0.034***

*** p<0.01, ** p<0.05, * p<0.1

RESULTS MODEL 2A

Regressions

Dependent variable: Natural logarithm of household income

Independent variable: Disability household

TABLE A3. 34. RESULTS MODEL 2A (DEPENDENT VARIABLE: NATURAL LOGARITHM HOUSEHOLD INCOME AND INDEPENDENT VARIABLE: PRESENCE OF AT LEAST ONE MEMBER WITH DISABILITY) CHILE CASEN 2009

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Elderly household	0.134***	0.130***	0.141***	0.135***	0.134***	0.136***	0.136***	0.135***
Children household	-0.034***	-0.047***	-0.044***	-0.041***	-0.041***	-0.037***	-0.037***	-0.034***
Disability household	-0.087***	-0.066***	-0.002	0	0.037***	-0.025***	-0.025***	-0.022***
Working household	0.488***	0.462***	0.411***	0.408***	0.407***	0.406***	0.405***	0.404***
Size household	0.029***	0.034***	0.052***	0.050***	0.051***	0.051***	0.053***	0.054***
Urban		0.173***	0.065***	0.053***	0.045***	-0.030***	-0.031***	-0.032***
Tarapaca		0.016	0.002	-0.021	-0.021	-0.028	-0.027	-0.028
Antofagasta		0.277***	0.260***	0.252***	0.251***	0.222***	0.223***	0.222***
Atacama		0.031*	0.054***	0.034*	0.032*	0.008	0.01	0.018
Coquimbo		-0.115***	-0.088***	-0.115***	-0.116***	-0.138***	-0.136***	-0.138***
Valparaiso		0.011	0.002	-0.015	-0.015	-0.033**	-0.033**	-0.035**
Libertador Bernardo		-0.121***	-0.073***	-0.086***	-0.087***	-0.115***	-0.114***	-0.116***
Maule		-0.214***	-0.166***	-0.182***	-0.184***	-0.209***	-0.208***	-0.209***
Bío Bío		-0.171***	-0.137***	-0.159***	-0.155***	-0.150***	-0.149***	-0.150***
Araucanía		-0.278***	-0.242***	-0.266***	-0.261***	-0.243***	-0.242***	-0.240***
Los Lagos		0.066***	0.093***	0.068***	0.073***	0.099***	0.101***	0.097***
Aysen		0.139***	0.155***	0.123***	0.122***	0.100***	0.102***	0.104***
Magallanes		0.297***	0.216***	0.209***	0.208***	0.185***	0.185***	0.182***
Metropolitan Region		0.056***	0.021	0.009	0.008	-0.02	-0.019	-0.021
Los Rios		-0.124***	-0.096***	-0.113***	-0.108***	-0.081***	-0.079***	-0.080***
Female head			-0.138***	-0.133***	-0.133***	-0.130***	-0.129***	-0.124***
Age head			0.010***	0.006***	0.006***	0.005***	0.005***	0.005***
Age head square			-0.000***	0.000	.0000	0.000*	0.000*	0.000*
Basic incomplete head			0.078***	0.076***	0.073***	0.065***	0.065***	0.064***
Basic complete head			0.184***	0.181***	0.175***	0.154***	0.153***	0.149***
Media humanistic incomplete head			0.261***	0.262***	0.256***	0.222***	0.220***	0.215***
Media technical incomplete head			0.346***	0.348***	0.340***	0.307***	0.306***	0.302***

Media humanistic complete head			0.427***	0.424***	0.418***	0.370***	0.367***	0.359***
Media technical complete head			0.529***	0.524***	0.518***	0.460***	0.457***	0.448***
Technological/university incomplete head			0.813***	0.813***	0.806***	0.740***	0.737***	0.728***
Technological/university complete head			1.094***	1.084***	1.077***	1.007***	1.005***	0.995***
Head working			0.156***	0.163***	0.162***	0.160***	0.161***	0.161***
Own dwelling				0.183***	0.181***	0.155***	0.155***	0.155***
Rent dwelling				0.108***	0.107***	0.087***	0.087***	0.086***
Disability*Poverty					-0.081***	0.069***	0.069***	0.069***
Poorest 40%						-0.217***	-0.216***	-0.210***
No school attendance							-0.078***	-0.076***
Chile Solidario								-0.099***
Constant	12.126***	12.103***	11.339***	11.348***	11.363***	11.581***	11.583***	11.597***
N	240705	240705	240705	240705	240705	240705	240705	240705
Ll	-2.55E+05	-2.47E+05	-2.25E+05	-2.23E+05	-2.23E+05	-2.21E+05	-2.21E+05	-2.21E+05
R2	0.343	0.383	0.489	0.496	0.496	0.504	0.504	0.505
AIC	5.10E+05	4.95E+05	4.49E+05	4.46E+05	4.46E+05	4.42E+05	4.42E+05	4.42E+05

*** p<0.01, ** p<0.05, * p<0.1

RESULTS MODEL 2B

Regressions

Dependent variable: Natural logarithm of household income

Independent variable: Head with disability

TABLE A3. 35. RESULTS MODEL 2B (DEPENDENT VARIABLE: NATURAL LOGARITHM HOUSEHOLD INCOME AND INDEPENDENT VARIABLE: HEAD OF THE HOUSEHOLD WITH DISABILITY) CHILE CASEN 2009

Variable	Model 9	Model 10	Model 12	Model 13	Model 14
Elderly household	0.140***	0.134***	0.133***	0.133***	0.132***
Children household	-0.044***	-0.041***	-0.036***	-0.036***	-0.033***
Working household	0.411***	0.408***	0.406***	0.406***	0.404***
Size household	0.052***	0.050***	0.050***	0.052***	0.053***
Urban	0.065***	0.053***	-0.030***	-0.031***	-0.032***
Tarapaca	0.003	-0.02	-0.028	-0.027	-0.028
Antofagasta	0.260***	0.253***	0.223***	0.223***	0.223***
Atacama	0.055***	0.035**	0.008	0.01	0.018
Coquimbo	-0.087***	-0.115***	-0.138***	-0.136***	-0.138***
Valparaiso	0.002	-0.014	-0.033**	-0.033**	-0.035**
Libertador Bernardo	-0.072***	-0.085***	-0.115***	-0.114***	-0.116***
Maule	-0.165***	-0.181***	-0.209***	-0.208***	-0.209***
Bío Bío	-0.136***	-0.158***	-0.149***	-0.149***	-0.150***
Araucanía	-0.241***	-0.264***	-0.242***	-0.241***	-0.239***
Los Lagos	0.094***	0.069***	0.099***	0.101***	0.097***
Aysen	0.155***	0.124***	0.100***	0.103***	0.104***
Magallanes	0.216***	0.209***	0.185***	0.185***	0.182***
Metropolitan Region	0.022	0.009	-0.02	-0.019	-0.021
Los Rios	-0.095***	-0.112***	-0.080***	-0.079***	-0.079***
Female head	-0.138***	-0.133***	-0.130***	-0.129***	-0.125***
Age head	0.010***	0.006***	0.005***	0.005***	0.004***
Age head square	-0.000***	0.000	0.000**	0.000**	0.000**

Head with disability	-0.019***	-0.017***	-0.036***	-0.037***	-0.033***
Basic incomplete head	0.078***	0.076***	0.065***	0.065***	0.064***
Basic complete head	0.183***	0.180***	0.154***	0.152***	0.148***
Media humanistic incomplete head	0.260***	0.262***	0.222***	0.220***	0.215***
Media technical incomplete head	0.345***	0.347***	0.307***	0.305***	0.301***
Media humanistic complete head	0.426***	0.423***	0.369***	0.367***	0.359***
Media technical complete head	0.528***	0.524***	0.460***	0.457***	0.448***
Technological/university incomplete head	0.812***	0.812***	0.740***	0.737***	0.728***
Technological/university complete head	1.093***	1.083***	1.008***	1.005***	0.995***
Head working	0.154***	0.161***	0.157***	0.158***	0.159***
Own dwelling		0.183***	0.155***	0.155***	0.155***
Rent dwelling		0.107***	0.087***	0.087***	0.086***
Disability*Poverty			-0.216***	-0.214***	-0.209***
Poorest 40%			0.062***	0.063***	0.063***
No school attendance				-0.079***	-0.077***
Chile Solidario					-0.099***
Constant	11.342***	11.351***	11.587***	11.589***	11.602***
N	240705	240705	240705	240705	240705
Ll	-2.25E+05	-2.23E+05	-2.21E+05	-2.21E+05	-2.21E+05
R2	0.489	0.496	0.504	0.504	0.505
AIC	4.49E+05	4.46E+05	4.42E+05	4.42E+05	4.42E+05
BIC	4.50E+05	4.47E+05	4.43E+05	4.43E+05	4.42E+05

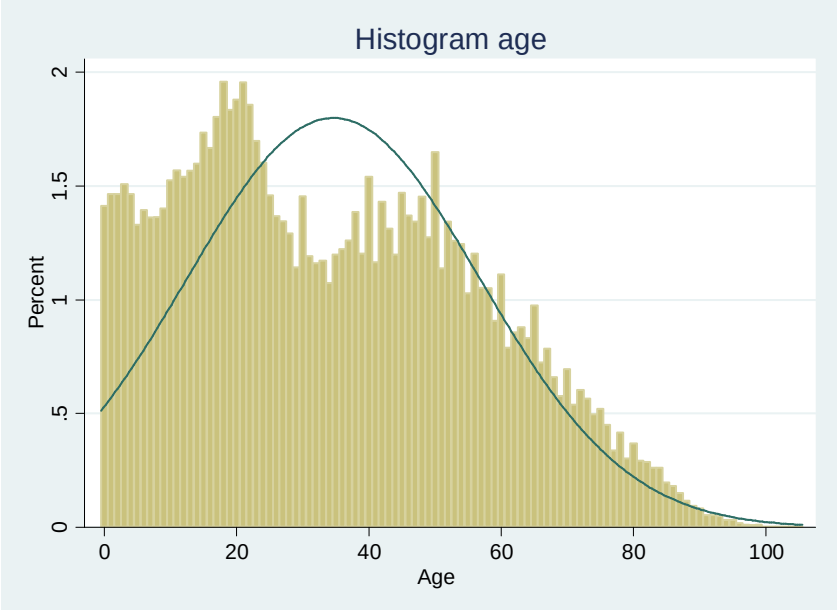
*** p<0.01, ** p<0.05, * p<0.1

CHILE CASEN 2011

DESCRIPTIVE STATISTICS

The average age was 37 years old with a maximum of 105 years old (Figure A3.13). 51.94% of the individuals in the sample were female. The average household size was four individuals per household and 48.7% of the population older than 12 years were working. In addition, 97% of the individuals older than 5 years were literate.

FIGURE A3. 13. HISTOGRAM AGE CHILE CASEN 2011



87% of the sample was living in the urban area, with 40.6% living in the metropolitan region. Around 60% of the sample had an educational level lower or equal than media technical incomplete (see table A3.36). It is important to highlight that the question level of education was asked for the whole sample, which creates that children are categorized as having no education even if they are not yet in school age.

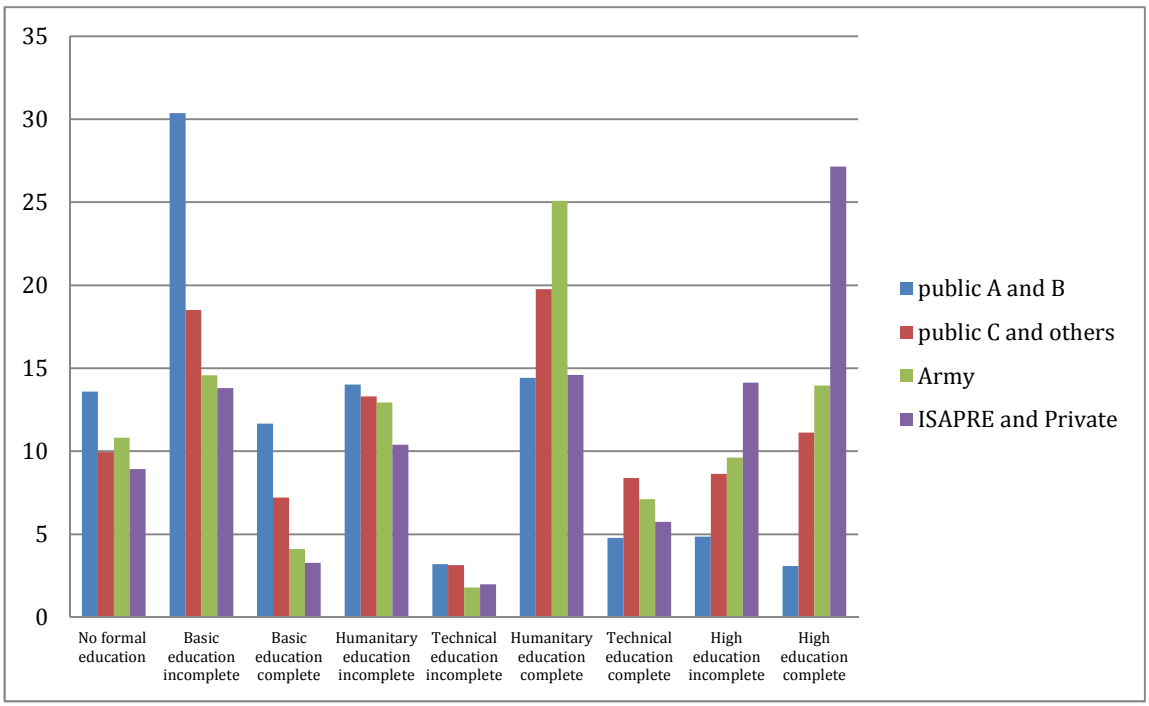
TABLE A3. 36. EDUCATION LEVEL TOTAL POPULATION CHILE CASEN 2011

	Percentage
No education	11.5
Basic incomplete	22.8
Basic complete	8.43
Media humanistic incomplete	14
Media technical incomplete	2.7
Media humanistic complete	16.5
Media technical complete	5.7
Technic superior incomplete	8.3
Technic superior complete	10.14

Of the working population, 60% were working in the private sector and 21% were self-employed. 34% of the households had a head of the household unemployed. In average each household had around 2 people working.

The type of health care system was associated with the level of education (Figure A3.14). In the lowest levels of education most people referred to having public health care insurance in the levels A and B. Contrary to what happen for those individuals who have a higher level of education, indeed, around 28% have a private health care insurance.

FIGURE A3. 14. TYPE OF HEALTH CARE INSURANCE BY EDUCATION LEVEL CHILE CASEN 2011



6.54% of the sample referred to have at least one type of long term difficulty, with physical limitation being the most prevalent (3.1% of the sample). Contrary to what happen in last two years, visual and hearing impairments have prevalence lower than 1% (Table A2.37).

TABLE A3. 37. TYPE OF IMPAIRMENT CHILE CASEN 2011

	Percentage
Physical impairment	3.13
Speaking impairment	0.28
Psychiatric illness	0.39
Mental or intellectual illness	0.67
Hearing impairment	0.87
Visual impairment	0.97
No impairment	93.69

The average age of those who referred to have at least one limitation was 56 years old, with a sex distribution of 56.3% female and 43.7% male. 16% of the

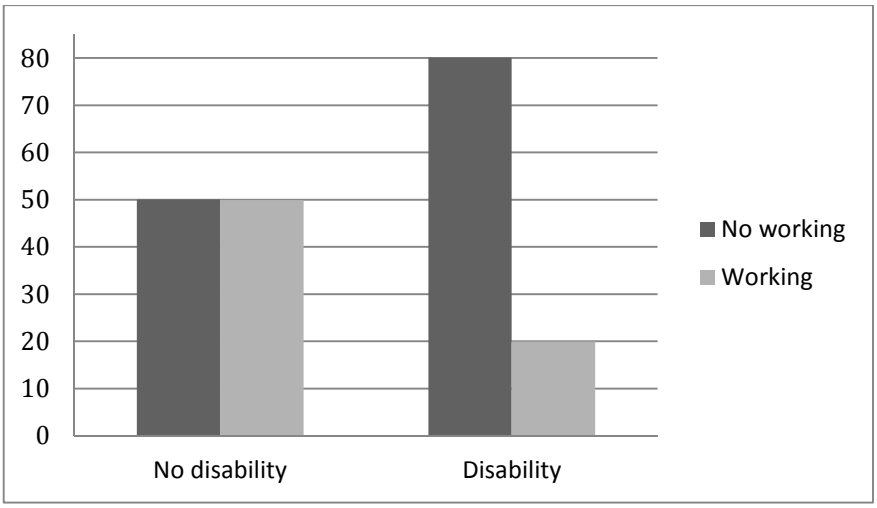
population with impairments were illiterate and around 66% had a level of education lower than primary school (Table A3.38).

TABLE A3. 38. LEVEL OF EDUCATION PEOPLE WITH DISABILITIES CHILE CASEN 2011

	Percentage
No education	19.43
Basic incomplete	30.6
Basic complete	15.6
Media humanistic incomplete	11.3
Media technical incomplete	1.8
Media humanistic complete	10.8
Media technical complete	3.3
Technic superior incomplete	2.3
Technic superior complete	4.8

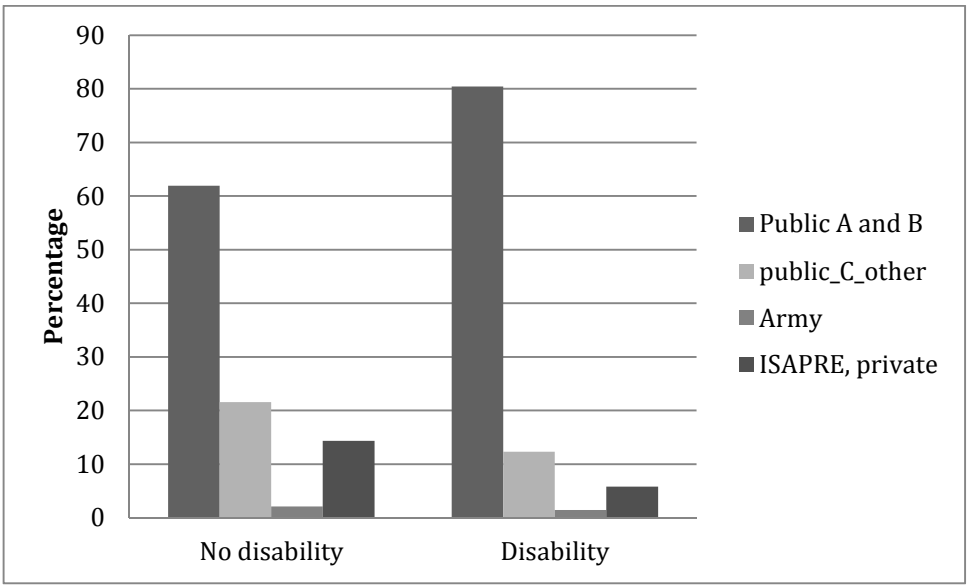
80% of the population with at least one limitation were not working and of those working 38% were self-employed (Figure A3.15). Individuals with mental or cognitive impairment had an unemployment rate close to 90%, and in all types of impairments the unemployment rate was higher than 70%.

FIGURE A3. 15. WORKING STATUS AND DISABILITY CHILE CASEN 2011



80% of the population with at least one type of impairment were enrolled in the public health care system in levels A and B (Figure A3.16), percentage that is higher than for individuals without impairments.

FIGURE A3. 16. DISABILITY AND HEALTH CARE INSURANCE CHILE CASEN 2011



VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLES

1. *National measure* of poverty: Chile uses as a measure of poverty a line of poverty, which is defined according to the minimum level of income that a person needs in order to satisfy their basic needs. It is estimated using the cost of a basic basket of food per person per month and a multiplication factor.

$$LP = k * CBA$$

LP= poverty line

CBA= Cost of a basket of food

k= multiplication factor

The final value of the basket of goods and the multiplication factor differ between rural and urban areas. The line for extreme poverty is equivalent

to the cost of a basic basket of food (Ministerio de Desarrollo Social, 2012b). This poverty line divides the population into three groups: extremely poor; poor and non-poor (Table A3.39). This has been the measure of poverty used in Chile for the last 20 years and it is comparative between years. However, it has been criticized for its simplicity and by ignoring the multidimensionality of poverty (Borzutzky, 2012).

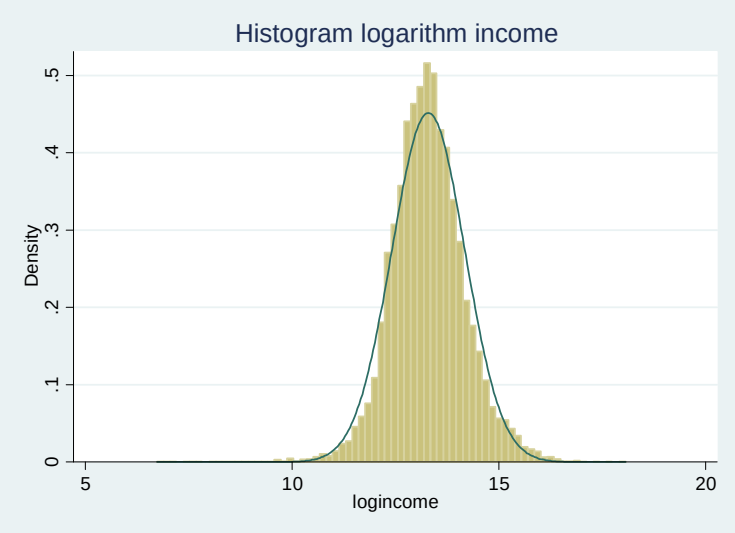
TABLE A3. 39. NATIONAL POVERTY MEASURE CHILE CASEN 2011

	Percentage
Extremely poor	2.8%
Poor	11.6%
Non-poor	85.5%

2. *Poverty:* It took the value of one when the person was considered extremely poor and poor, and 0 if the person was considered non poor

3. *Natural logarithm of total household income*: The total household income was transformed to a natural logarithm to improve kurtosis and symmetry of the distribution (Figure A3.17).

FIGURE A3. 17. HISTOGRAM LOGARITHM INCOME CHILE CASEN 2011



INDEPENDENT VARIABLE:

The independent variables can be divided in the follow subgroups:

1. *Household Characteristics:*

    a. *Disability in the household:* Dichotomous variable that represented the existence of at least one member with disability in the household. In 2011, 18.1% of individuals were living in a household with at least one disabled member (Table A3.40).

TABLE A3. 40. DISABILITY IN THE HOUSEHOLD CHILE CASEN 2011

	Percentage
No disabled members	81.91
Disabled members	18.09

    b. *Number of children (members younger than 12 years old):* Continuous variable that took values between 0 and 4 and it represented the number of individuals younger than 12 years per household (Table A3.41).

TABLE A3.41. NUMBER OF CHILDREN PER HOUSEHOLD CHILE CASEN 2011

Number children per household	Percentage
0	45.52
1	30.06
2	17.36
3	5.47
4 or more	1.59

    c. *Number of elderly members (older than 65 years old):* Continuous variable that took values between 0 and 4, it included the count of the number of people older than 65 years old (Table A3.42).

TABLE A3. 42. NUMBER OF ELDERLY MEMBERS CHILE CASEN 2011

Number elderly household	Percentage
0	76.62
1	17.4
2	6.7
3	0.25
4 or more	0.2

d. *Number of people working in a household*: Continuous variable that took values between 0 and 4. It included the count of the number of people who were working and receiving a salary per household (Table A3.43).

TABLE A3. 43. NUMBER OF WORKING MEMBERS CHILE CASEN 2011

Number of working members per household	Percentage
0	10.69
1	38.77
2	32.7
3	11.95
4 or more	5.89

e. *Number of people from other ethnic groups*: Continuous variable that took values between 0 and 5. It was the count of the number of people that identified as belonging to a different ethnic group (non-white) (Table A3.44).

TABLE A3. 44. ETHNIC GROUPS CHILE CASEN 2011

Number of people from different ethnic groups	Percentage
0	88.36
1	2.89
2	2.22
3	2.58
4	1.88
5 or more	2.07

f. *Size household*: Continuous variable with values between 1 and 20. The average size of the household was 4.2 individuals per household.

2. *Area:* Dichotomous variable, which took the value of one when the person lived in urban areas and 0 when in rural areas.

3. *Region:* Dichotomous variables that represented each of the regions in Chile. Each of them took the value of one when the person lived in that region and 0 when not. For this year, the variable of Magallanes was the reference variable.

4. *Head of the household characteristics:*

    a. *Female head of the household*: Dichotomous variable that took the value of one when the person was living in a household, whose head was female and 0 otherwise (Table A3. 45).

TABLE A3. 45. SEX HEAD OF THE HOUSEHOLD CHILE CASEN 2011

Male head	64.74
Female head	35.26

    b. *Age head of the household*: Continuous variable that represented the age of the head of the household. It took values between 18 and 104 and the average age was 51 years.

    c. *Age head square*: Continuous variable that represented the square of the age of the head of the household.

    d. *Head level of education*: Dichotomous variables that represented the level of education of the head of household. Each variable took the value of one when the person was living in a household, whose head reported to have that level of education and 0 otherwise (Table A3. 46).

TABLE A3. 46. LEVEL OF EDUCATION HEAD OF THE HOUSEHOLD CHILE CASEN 2011

Education head household	Percentage
None	2.64
Special education	0.07
Primary school	11.03
Basic education	22.22
Humanities	5.91
Media education	29.7
Technical/commercial	1.12
Technical media	8.18
Technical superior	5.89
Professional	12.27
Post-graduate	0.98

e. *Head working:* Dichotomous variable that took the value of one if the person was living in a household, whose head was working and 0 if not (Table A3.47).

TABLE A3. 47. HEAD OF THE HOUSEHOLD WORKING CHILE CASEN 2011

	Percentage
Head no working	29.59
Head working	70.41

f. *Head with disability*: Dichotomous variable that took the value of one if the person was living in a household, whose head had disability and 0 if not. (Table A3.48).

TABLE A3. 48. HEAD OF THE HOUSEHOLD WITH DISABILITY CHILE CASEN 2011

	Percentage
Head without disability	92.4
Head with disability	7.6

5. *Type of ownership of the dwelling*:

a. *Own the property*: Dichotomous variable that took the value of one if the family owned the house where they were living and 0 if not. It included the options of own the house, owns the house

but is paying a mortgage and owns the house and share the debt with others.

b. *Rent the property*: Dichotomous variable that took the value of one if the family lived in a rented house or a flat and 0 otherwise. It included the options of rented with contract and without a contract.

c. *Other*: This variable included all other options of ownership the dwelling where the household lived (transferred, invasion, other). It took the value of one if the dwelling where the family lived was occupied under these conditions and 0 if not.

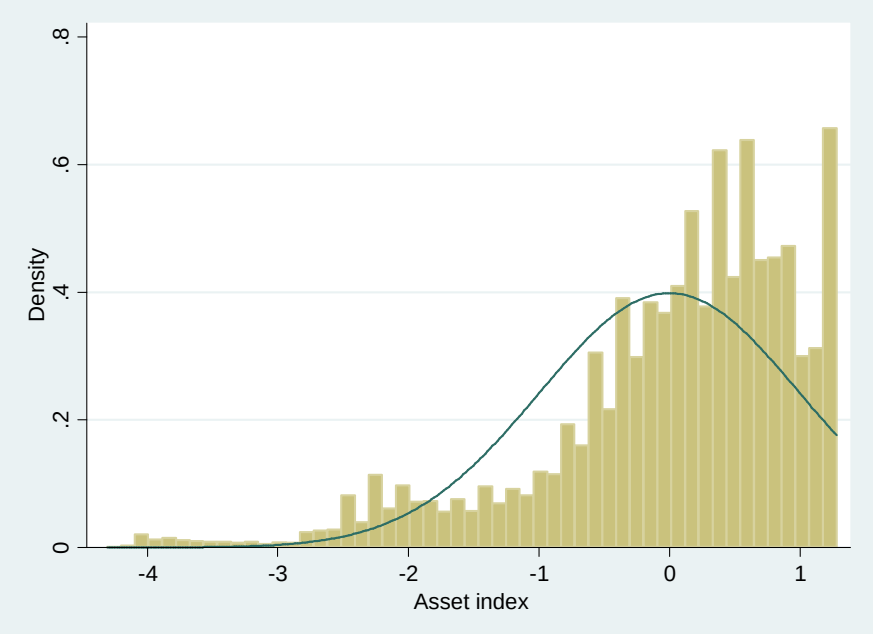
6. *Poorest 40% according to the asset index*: Dichotomous variable that took the value of one if the person lived in the poorest 40% according to the asset index and 0 other wise.

    a. *Asset index:* The first component explained the variance of the variables by 17%. The results of the first component are presented in table A3.49. The values of the first component were small, but the index increased when the household had better characteristics (brick as the walls material; ceramic as floor material; public sewerage, source of water and energy). Additionally, the ownership of any asset increased the values of the index. Figure A3.18 presents the histogram of the first component and Figure A3.19 how each variable contributes to the asset index in rural and urban areas.

TABLE A3. 49. FIRST COMPONENT VALUES CHILE CASEN 2011

Variable	First component
Washing machine	0.19
Fridge	0.16
Heater	0.25
Phone	0.22
TV cable	0.18
PC	0.24
internet	0.23
Car	0.11
Water from public aqueduct	0.32
Water from public aqueduct but without meter	-0.07
Water from a well	-0.22
Other sources of water	-0.22
Public sewerage	0.32
Sewerage connect to a fossa	-0.17
Black well	-0.26
Other type of sewerage	-0.07
Energy from a public source	0.20
Energy from a public source not meter	-0.08
Other sources of energy	-0.13
No energy	-0.12
Walls material: Bricks	0.21
Walls material: Tabique	-0.21
Other type of walls material	-0.01
Floor material: Wood	-0.17
Floor material: Ceramic	0.22
Floor material: Carpet	0.02
Floor material: Cement	-0.08
Floor material: Earth	-0.08
Floor material: Concrete flooring	-0.08
Floor material: Cement veneer	-0.04

FIGURE A3. 18. HISTOGRAM ASSET INDEX CHILE CASEN 2011



7. *No school attendance:* Dichotomous variable that represented the existence of at least one school age (older than four- younger than 18) child that is not attending school (Table A3.50).

TABLE A3. 50. SCHOOL ATTENDANCE HOUSEHOLD CHILE CASEN 2011

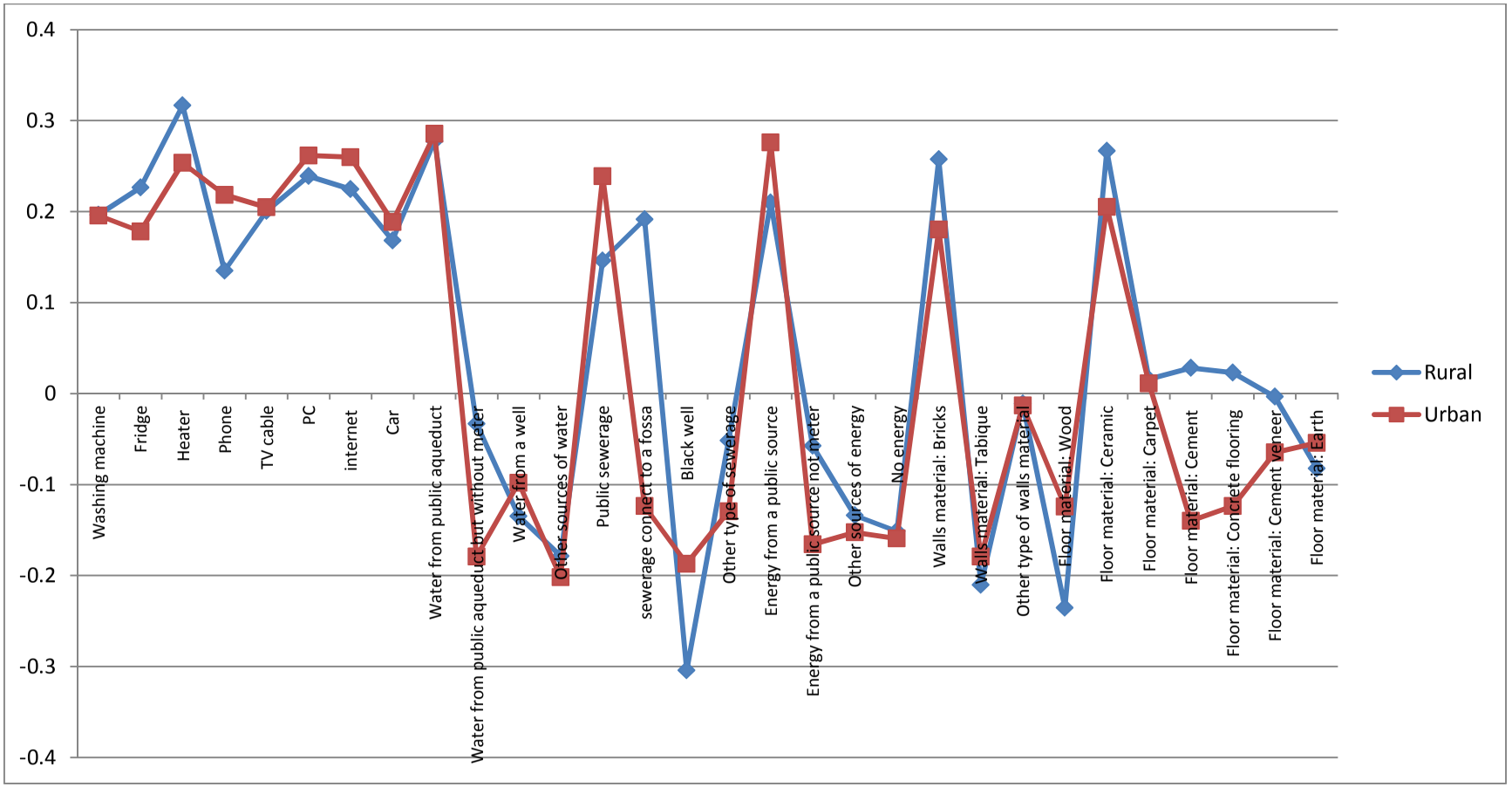
	Percentage
School attendance	97.25
No school attendance	2.75

8. *Subsidies –Chile Solidario:* Dichotomous variable that took the value of one when the household was receiving the subsidy "Chile Solidario" and 0 if not (Table A2.51).

TABLE A3. 51. CHILE SOLIDARIO CHILE CASEN 2011

	Percentage
No Chile Solidrio	94.18
Chile Solidario	5.82

FIGURE A3. 19. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS CHILE CASEN 2011



CROSS-SECTIONAL ANALYSIS

RESULTS MODEL 1A

Marginal effects generalize ordinal logit

Dependent variable: Situation of poverty (three categories).

Independent variable: Disability household

TABLE A3. 52. RESULTS MODEL 1A (DEPENDENT VARIABLE: SITUATION OF POVERTY AND INDEPENDENT VARIABLE: PRESENCE OF AT LEAST ONE MEMBER WITH DISABILITY) CHILE CASEN 2011

Variable	Extremely poor	Poor	Non-poor
Working household	-0.047***	-0.117***	0.164***
Disability household	-0.003***	0.007***	-0.004***
Elderly household	-0.016***	-0.040***	0.056***
Children household	0.002***	0.005***	-0.007***
Any ethnic group household	0.001***	0.003***	-0.004***
Size of the household	0.009***	0.043***	-0.053***
Urban	0.022***	0.121***	-0.143***
Tarapaca	0.005***	0.012**	-0.017**
Antofagasta	-0.007***	-0.018**	0.025**
Atacama	0.010***	0.024**	-0.033**
Coquimbo	0.015***	0.067**	-0.081**
Valparaiso	0.024***	0.059**	-0.083**
Libertador Bernardo	0.008***	0.052**	-0.060**
Maule	0.023***	0.077**	-0.100**
Bío Bío	0.028***	0.070**	-0.098**

Araucanía	0.030***	0.074**	-0.104**
Los Lagos	0.015***	0.038**	-0.053**
Aysen	0.005***	0.012**	-0.017**
Metropolitan Region	0.016***	0.040**	-0.055**
Los Rios	0.016***	0.057**	-0.072**
Arica and Parinacot	0.006**	0.047**	-0.053**
Female head	0.005***	0.031***	-0.036***
Age head	0.000***	-0.001***	0.001***
Age head square	0.000***	0.000***	0.000***
Primary School head	-0.007***	-0.018**	0.025***
Basic education head	-0.005***	-0.013**	0.018***
Humanities head	-0.016***	-0.039**	0.054**
Media education head	-0.016***	-0.041**	0.057**
Technical complete head	-0.021**	-0.052**	0.073**
Technical/media head	-0.023***	-0.057**	0.079***
Technical/ high education head	-0.027***	-0.112**	0.139**
Professional head	-0.032***	-0.155**	0.187**
Postgraduate head	-0.059**	-0.259**	0.318*
Head working	-0.007***	0.012***	-0.004***
Poorest 40%	0.016***	0.051***	-0.067***
Own dwelling	-0.021***	-0.038***	0.059***
Rent dwelling	-0.007***	-0.019***	0.026***
No school attendance	0.009***	0.022**	-0.031***
Chile Solidario	0.007***	0.018***	-0.025***

*** p<0.01, ** p<0.05, * p<0.1

RESULTS MODEL 1B

Marginal effects generalize ordinal logit

Dependent variable: Situation of poverty (three categories).

Independent variable: Head of the household with disability

TABLE A3. 53. RESULTS MODEL 1B (DEPENDENT VARIABLE: SITUATION OF POVERTY AND INDEPENDENT VARIABLE: PRESENCE OF AT LEAST ONE MEMBER WITH DISABILITY) CHILE CASEN 2011

	Extremely poor	Poor	No poor
Children household	0.002***	0.005***	-0.007***
Working household	-0.047***	-0.117***	0.164***
Elderly household	-0.019***	-0.035***	0.055***
Any ethnic group household	0.001***	0.003***	-0.004***
Size household	0.009***	0.043***	-0.053***
Urban	0.022***	0.122***	-0.143***
Tarapaca	0.005***	0.012***	-0.016**
Antofagasta	-0.007***	-0.018***	0.025**
Atacama	0.009***	0.024***	-0.033**
Coquimbo	0.015***	0.066**	-0.081**
Valparaiso	0.024***	0.059***	-0.083**
Libertador Bernardo	0.008***	0.052**	-0.060**
Maule	0.022***	0.078***	-0.100**
Bío Bío	0.028***	0.070***	-0.098**
Araucanía	0.030***	0.074***	-0.104**

Los Lagos	0.015***	0.038***	-0.053**
Aysen	0.005***	0.012***	-0.017**
Metropolitan Region	0.016***	0.040***	-0.055**
Los Rios	0.015***	0.057***	-0.072**
Arica and Parinacot	0.006***	0.047**	-0.052**
Head with disability	0.001***	0.004***	-0.005**
Female head	0.005***	0.031***	-0.036***
Age head	0.000***	-0.001***	0.001***
Age head square	0.000***	0.000***	0.000***
Primary School head	-0.007***	-0.018***	0.025***
Basic education head	-0.005***	-0.012***	0.017***
Humanities head	-0.015***	-0.039***	0.054***
Media education head	-0.016***	-0.041***	0.057***
Technical complete head	-0.021***	-0.052**	0.073**
Technical/media head	-0.023***	-0.057***	0.079**
Technical/ high education head	-0.027***	-0.112***	0.139**
Professional head	-0.032***	-0.155***	0.187*
Postgraduate head	-0.058**	-0.260**	0.318***
Head working	-0.007***	0.012***	-0.004***
Poorest 40%	0.016***	0.052***	-0.067***
Own dwelling	-0.021***	-0.038***	0.059***
Rent dwelling	-0.007***	-0.019***	0.026***
No school attendance	0.009***	0.022***	-0.031***
Chile Solidario	0.007***	0.018***	-0.025***

*** p<0.01, ** p<0.05, * p<0.1

RESULTS MODEL 2A

Regressions

Dependent variable: Natural logarithm of household income

Independent variable: Disability household

TABLE A3. 54. RESULTS MODEL 2A (DEPENDENT VARIABLE: NATURAL LOGARITHM HOUSEHOLD INCOME AND INDEPENDENT VARIABLE: PRESENCE OF AT LEAST ONE MEMBER WITH DISABILITY) CHILE CASEN 2011

Variable	model1	model2	model3	model4	model5	model6	mode7	mode8
Working household	0.458***	0.439***	0.404***	0.399***	0.397***	0.396***	0.394***	0.395***
Disability household	-0.135***	-0.118***	-0.054***	-0.042***	-0.042***	-0.041***	-0.040***	-0.079***
Elderly household	0.088***	0.093***	0.130***	0.128***	0.122***	0.121***	0.120***	0.122***
Children household	-0.050***	-0.060***	-0.038***	-0.030***	-0.027***	-0.027***	-0.024***	-0.024***
Any ethnic group household	-0.051***	-0.047***	-0.024***	-0.020***	-0.022***	-0.021***	-0.021***	-0.021***
Size household	0.040***	0.039***	0.047***	0.044***	0.041***	0.043***	0.044***	0.044***
Urban		0.148***	0.035***	-0.109***	-0.116***	-0.117***	-0.116***	-0.116***
Tarapaca		-0.116***	-0.098***	-0.087***	-0.087***	-0.087***	-0.088***	-0.087***
Antofagasta		0.092***	0.062***	0.046**	0.057***	0.059***	0.060***	0.061***
Atacama		-0.161***	-0.117***	-0.113***	-0.115***	-0.114***	-0.107***	-0.106***
Coquimbo		-0.379***	-0.311***	-0.305***	-0.316***	-0.316***	-0.314***	-0.314***
Valparaiso		-0.319***	-0.321***	-0.309***	-0.311***	-0.311***	-0.309***	-0.308***
Libertador Bernardo		-0.372***	-0.282***	-0.267***	-0.271***	-0.271***	-0.268***	-0.267***
Maule		-0.485***	-0.372***	-0.355***	-0.365***	-0.364***	-0.361***	-0.361***
Bío Bío		-0.464***	-0.386***	-0.330***	-0.342***	-0.342***	-0.336***	-0.336***
Araucanía		-0.431***	-0.395***	-0.322***	-0.334***	-0.334***	-0.327***	-0.327***
Los Lagos		-0.312***	-0.242***	-0.158***	-0.171***	-0.171***	-0.168***	-0.168***
Aysen		-0.070***	-0.015	0.016	0.004	0.005	0.008	0.009

Metropolitan Region		-0.134***	-0.166***	-0.173***	-0.165***	-0.165***	-0.164***	-0.163***
Los Rios		-0.340***	-0.308***	-0.235***	-0.241***	-0.240***	-0.238***	-0.237***
Arica and Parinacot		-0.212***	-0.213***	-0.210***	-0.201***	-0.201***	-0.200***	-0.200***
Female head			-0.154***	-0.144***	-0.140***	-0.140***	-0.136***	-0.135***
Age head			0.018***	0.015***	0.011***	0.011***	0.011***	0.011***
Age head square			-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
Primary School head			0.121***	0.091***	0.094***	0.093***	0.093***	0.096***
Basic education head			0.107***	0.078***	0.084***	0.083***	0.085***	0.090***
Humanities head			0.344***	0.274***	0.289***	0.288***	0.288***	0.294***
Media education head			0.328***	0.253***	0.264***	0.262***	0.261***	0.265***
Technical complete head			0.493***	0.417***	0.434***	0.432***	0.432***	0.438***
Technical/media head			0.456***	0.366***	0.377***	0.375***	0.371***	0.375***
Technical/ high education head			0.800***	0.678***	0.685***	0.683***	0.677***	0.679***
Professional head			1.183***	1.057***	1.061***	1.058***	1.053***	1.055***
Postgraduate head			1.751***	1.619***	1.612***	1.609***	1.603***	1.605***
Head working			0.077***	0.074***	0.077***	0.077***	0.078***	0.079***
Poorest 40%				-0.304***	-0.276***	-0.275***	-0.271***	-0.288***
Own dwelling					0.220***	0.220***	0.219***	0.218***
Rent dwelling					0.126***	0.126***	0.124***	0.123***
No school attendance						-0.096***	-0.093***	-0.092***
Chile Solidario							-0.101***	-0.100***
Disability*Poverty								0.085***
Constant	12.421***	12.600***	11.685***	12.067***	12.021***	12.022***	12.023***	12.024***
N	199855	199855	199855	199855	199855	199855	199855	199855
Ll	0.313	0.362	0.514	0.532	0.54	0.54	0.541	0.542
R2	4.38E+05	4.23E+05	3.69E+05	3.61E+05	3.58E+05	3.58E+05	3.57E+05	3.57E+05
AIC	4.38E+05	4.23E+05	3.69E+05	3.61E+05	3.57E+05	3.57E+05	3.57E+05	3.57E+05

*** p<0.01, ** p<0.05, * p<0.1

RESULTS MODEL 2B

Regressions

Dependent variable: Natural logarithm of household income

Independent variable: Head with disability

TABLE A3. 55. RESULTS MODEL 2B (DEPENDENT VARIABLE: NATURAL LOGARITHM HOUSEHOLD INCOME AND INDEPENDENT VARIABLE: PRESENCE OF AT LEAST ONE MEMBER WITH DISABILITY) CHILE CASEN 2011

Variable	mode9	mode10	mode11	mode13	mode14	mode15
Children household	-0.036***	-0.029***	-0.025***	-0.026***	-0.023***	-0.022***
Working household	0.406***	0.400***	0.398***	0.397***	0.396***	0.397***
Elderly household	0.124***	0.123***	0.117***	0.116***	0.116***	0.114***
Any ethnic group household	-0.024***	-0.021***	-0.022***	-0.021***	-0.021***	-0.021***
Size household	0.045***	0.042***	0.040***	0.041***	0.042***	0.041***
Urban	0.035***	-0.109***	-0.117***	-0.117***	-0.116***	-0.116***
Tarapaca	-0.098***	-0.087***	-0.087***	-0.087***	-0.088***	-0.088***
Antofagasta	0.062***	0.046**	0.058***	0.060***	0.061***	0.061***
Atacama	-0.117***	-0.113***	-0.115***	-0.114***	-0.106***	-0.106***
Coquimbo	-0.311***	-0.305***	-0.316***	-0.316***	-0.314***	-0.314***
Valparaiso	-0.322***	-0.310***	-0.312***	-0.312***	-0.310***	-0.310***
Libertador Bernardo	-0.282***	-0.267***	-0.271***	-0.271***	-0.268***	-0.268***
Maule	-0.373***	-0.356***	-0.365***	-0.365***	-0.361***	-0.361***
Bío Bío	-0.387***	-0.330***	-0.342***	-0.341***	-0.336***	-0.336***
Araucanía	-0.395***	-0.322***	-0.334***	-0.333***	-0.326***	-0.326***
Los Lagos	-0.243***	-0.159***	-0.171***	-0.171***	-0.168***	-0.168***
Aysen	-0.015	0.016	0.004	0.005	0.008	0.008
Metropolitan Region	-0.167***	-0.174***	-0.165***	-0.165***	-0.164***	-0.164***

Los Rios	-0.307***	-0.234***	-0.240***	-0.239***	-0.237***	-0.236***
Arica and Parinacot	-0.212***	-0.209***	-0.200***	-0.200***	-0.199***	-0.199***
Head with disability	-0.070***	-0.061***	-0.060***	-0.060***	-0.059***	-0.077***
Female head	-0.155***	-0.145***	-0.142***	-0.141***	-0.137***	-0.137***
Age head	0.017***	0.014***	0.010***	0.010***	0.010***	0.010***
Age head square	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
Primary School head	0.120***	0.090***	0.093***	0.092***	0.092***	0.094***
Basic education head	0.106***	0.078***	0.083***	0.083***	0.084***	0.087***
Humanities head	0.343***	0.273***	0.288***	0.287***	0.286***	0.289***
Media education head	0.329***	0.253***	0.264***	0.262***	0.261***	0.263***
Technical complete head	0.491***	0.415***	0.432***	0.430***	0.430***	0.433***
Technical/media head	0.457***	0.366***	0.377***	0.375***	0.371***	0.373***
Technical/ high education head	0.801***	0.678***	0.685***	0.683***	0.677***	0.679***
Professional head	1.184***	1.057***	1.061***	1.058***	1.053***	1.055***
Postgraduate head	1.752***	1.619***	1.612***	1.609***	1.603***	1.605***
Head working	0.073***	0.070***	0.074***	0.074***	0.075***	0.075***
Poorest 40%		-0.305***	-0.277***	-0.276***	-0.272***	-0.281***
Own dwelling			0.220***	0.220***	0.219***	0.219***
Rent dwelling			0.126***	0.126***	0.124***	0.124***
No school attendance				-0.097***	-0.095***	-0.095***
Chile Solidario					-0.101***	-0.101***
Disability*Poverty						0.042***
Constant	11.698***	12.079***	12.033***	12.035***	12.035***	12.039***
N	199855	199855	199855	199855	199855	199855
Ll	5.14E-01	5.32E-01	5.40E-01	5.40E-01	5.41E-01	5.41E-01
R2	3.69E+05	3.61E+05	3.58E+05	3.58E+05	3.57E+05	3.57E+05
AIC	3.69E+05	3.61E+05	3.57E+05	3.57E+05	3.57E+05	3.57E+05

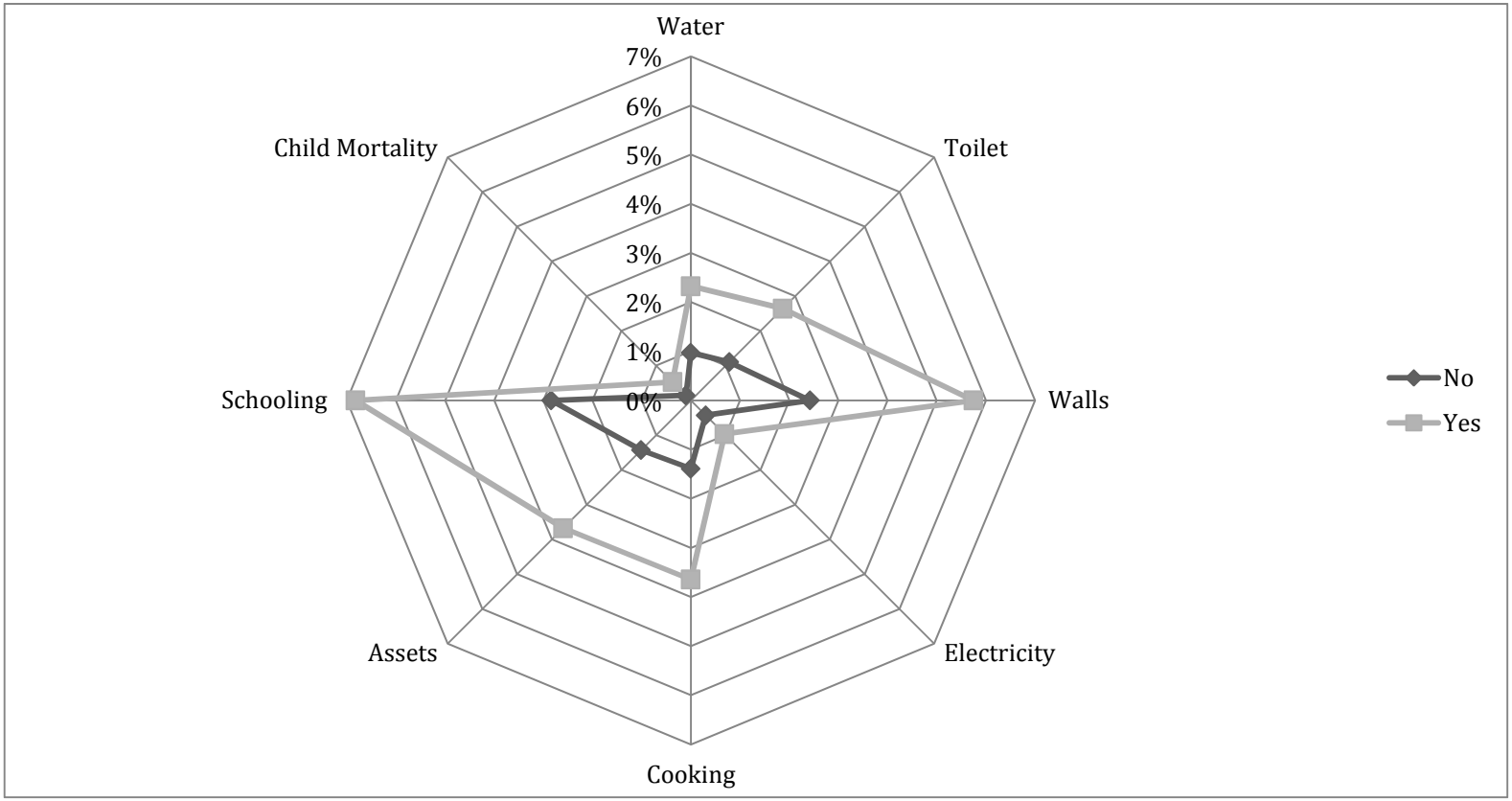
*** p<0.01, ** p<0.05, * p<0.1

MULTIDIMENSIONAL POVERTY ANALYSIS

TABLE A3. 56. DIMENSIONS, INDICATORS AND WEIGHTS MULTIDIMENSIONAL POVERTY ANALYSIS CHILE

Dimension	Indicator	Definition		Weight
Health	Child mortality	Any child has died in the family	Is the result of the question related to ever child alive and current child alive	1/3
Education	Years schooling	Number of household members older than 12 that have at least than six years of schooling (primary school)		1/3
Living Standard	Electricity	If the dwelling has no electricity		1/18
	Water	The household does not have access to safe drinking water such as aqueduct.	Deprive if : the household has access to water by well or water wheel, river, spring or stream	1/18
	Sanitation	The household sanitation is not improved or in shared with other households	Deprived if : toilet connected to septic tank, letrina or no toilet	1/18
	Walls material	The household has waste walls, wood or adobe walls		1/18
	Cooking fuel	The household does not have a place to cook, or cooks with wood, charcoal or paraffin	Deprived paraffin, wood, sawdust, charcoal or not cooking. Not deprived if natural gas, liquefied petroleum or electricity	1/18
	Asset ownership	The household does not own more than one assets of the following list: TV, washing machine, fridge, phone, computer, car or microwave	It is always not deprive if the household has a car	1/18

FIGURE A3. 20. CENSORED HEADCOUNT HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS MULTIDIMENSIONAL POVERTY ANALYSIS CHILE



APPENDIX 4

COLOMBIA

SOCIAL PROTECTION SYSTEM

SOCIAL INSURANCE

Colombia was classified by Carmelo Mesa-Lago (1991) as an intermediate country in the development of the social security system. A basic security fund was established at the end of 1930s and beginning of 1940s (Haggard and Kaufman, 2008). The coverage was limited to urban areas during the first two decades and only in the 1960s benefits were extended to families of members of individuals enrolled in the system.

Different liberal and conservative governments were in power during the 1960s and the 1970s. Nevertheless, no major reforms were implemented to the social security system. The economic crisis during the 1980s hit the entire region, but had a less severe impact on the economy of Colombia, because the economic characteristics of the country were better compared to other LA countries (low levels of national debt). Therefore, levels of poverty and inequality did not increase as much as in other LA countries (Haggard and Kaufman, 2008).

The social security system in Colombia was the most fragmented in the region, with around 1,000 institutions that provided care to 21% of the working population. Indeed, the Social Insurance Institute (ISS) enrolled 70% of the insured population. Although, the ISS was expected to cover around 65% of the national

population, less than half had real access, and usually poor populations living in rural areas were not enrolled in the system. Additionally, benefits differed according to the type of institution the person was enrolled in. For example, the age of retirement depended on the institution that the person contributed to, this had an effect on the levels of inequalities between insured groups (Kritzer, 2000, Mesa-Lago, 1997).

Problems related to violence and drug trafficking were the main source of political and social instability in the country. In order to change the negative perspective these problems created during the 1980s, the government of Cesar Gaviria (1990-1994) presented a new constitution that established the Colombian State as Social-democratic and that all people living in the national territory have a right to health care, to education and to other forms of social protection (Haggard and Kaufman, 2008). The 1991 constitution was the first step to implement a new social security system with principles of universality, equity and solidarity. However, the principles established in the constitution were not the same of the new market-oriented and neoliberal economic development model that the country implemented during 1990s.

Reforms in the health care and the pension system were implemented under the government of Cesar Gaviria. Those reforms followed the advice of international organization and included several of the parameters proposed by the Washington Consensus. A completed structural reform of the social security system was implemented in 1993. The new General Social Security System (Sistema General de Seguridad Social (SGSS)) included three main components: a pension programme,

a health care programme and a professional risk management programme. The SGSS allowed the provision of services by private companies in each of the components and reduced the role of the State. Although, the reform followed neoliberal principles, it was not as severe as that implemented by Chile.

In the new pension system, the public sector was not closed and individuals had the opportunity to choose between a public and a private sector. Individuals older than 35 years old, who were enrolled in the ISS previous to the reform, had the right to continue in the public system with the same package of benefits. The public system keep the same pay as you go retirement plan, with a minimum contribution of 20 years and a retirement age of 62 for men and 57 for women. The contribution was 14.5% of the salary with contributions from the employer and the employee (Mesa-Lago, 1997). On the other hand, individual accounts were created in the private sector. In the private sector the age or weeks of contribution were not important, in fact, as in the case of Chile the person can obtain a pension after saving a minimum level of income. In this new system, the State has to guarantee a minimum pension to those individuals who have contributed for more than 23 years (Kritzer, 2000). In cases were the person did not fulfil the requirements to obtain a pension, the money from the contributions could be refunded by the private or public system.

Both systems offer disability and survivor pensions. The requirements to obtain a disability pension are associated with a medical assessment of the level earning capacity loss and the number of weeks that a person contributed to the system before the accident. In both systems, the person has the right of this pension if they

have lost at least 50% of their earning capacity and contributed 25 weeks during the year previous to the accident. Depending on these two parameters, the individual would receive from 25% to 75% of the basic monthly wage earned before the accident. Pensions for survivors are payable to a spouse, children younger than 18 years and other person who were economically dependent, the amount is from 45% and 75% (Kritzer, 2000).

Principles of universality, equity and solidarity were the main focus of the health care reform (Florez and Tono, 2002). It aimed to promote decentralization, to improve efficiency and equity in health care delivery with an increase in the health insurance coverage, with a main goal of universal coverage by 2000 (Camacho and Conover, 2009). After the reform, access to health care was organised through two insurance programmes: 1) Contribute Regime (CR) and 2) Subsidized Regime (SR). The CR is associated with working in the formal labour sector of the economy, indeed, employees, retirees, and high-income self-employers have to be compulsorily enrolled in this regime. Health-Promoting Enterprises (EPS) are the main insurance companies in the CR, workers have to choose and EPS and a compulsory contribution of 12.5% payroll tax should be done by the employer (8.5%) and employee (4%) (Bertranou, 1999, Castano, 2004). The SR aimed to enrol unemployed, poor self-employed (mostly informal workers), and poor and vulnerable groups (elderly, chronically ill, people displaced by the armed conflict and other populations). Individuals enrolled in the SR should select a Health-Promoting Enterprises for SR (EPS-S), which offers a network of providers in three levels of coverage, which are usually public providers (Castano, 2004).

Despite the existence of the two types of insurance schemes, a percentage of population was not enrolled in any of them. A small proportion of individuals had the characteristics to belong to the SR but did not select an EPS-S, therefore, they do not have an insurance company to cover their expenses, but they have access to the system using supply side subsidies. Another percentage of the population is not covered by any of the regimes and cannot gain access to the system because they are not categorized as poor or vulnerable populations (Gaviria et al., 2006).

The highest achievement of the reform was the increase in the enrolment of poor and vulnerable populations. These groups were completely excluded in the previous system and have gained access to the health care system through the SR. Nevertheless, the percentage of people enrolled in the CR decreased as a result of the high non-wage cost connected to social security and the goal of universal coverage by 2000 was not fulfilled (Restrepo, 2002).

SOCIAL ASSISTANCE

As in other LA countries, social assistance programmes do not have a long history in Colombia. The development of those programmes has been influenced by the high levels of poverty and the negative impact that macroeconomic crises have on poor populations. Only during the government of Alvaro Uribe (2002-2010), a CCT programme, aiming to reduce intergenerational poverty and to increase human capital of poor populations was implemented. *Familias en Accion* followed a similar design to the CCTs *Oportunidades* in Mexico and *Bolsa de Familia* in Brazil. The State transferred a monthly amount of money to families with children between 7 and 17 years old. As with the other programmes, families who received the subsidy

had to satisfy conditions related to school enrolment and medical check-ups of children who were the beneficiaries (Union temporal IFS-Econometria-SEI, 2004).

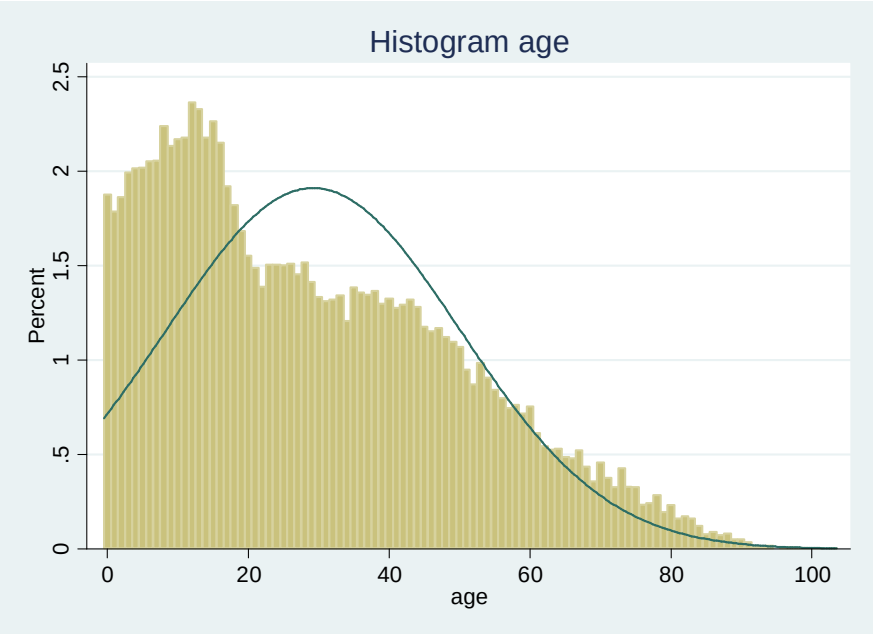
The evaluation of the programme demonstrated positive results in the increase of education enrolment and improvement in the levels of nutrition of children (Union temporal IFS-Econometria-SEI, 2004). Nevertheless, the impact of the programme on the national poverty rate is not clear and there is no evidence of a reduction of poverty of families who are beneficiaries. The programme has been expanded to most areas of the country. In 2008, *Familias en Accion* became an integrated anti-poverty programme (*Red Juntos*), whose main objective is to reduce multidimensional poverty, providing opportunities to poor families to increase their capabilities and escape from poverty.

COLOMBIA QOLS 2008

DESCRIPTIVE STATISTICS

The average age was 29 years old, with a maximum of 103 (Figure A4.1). 52% of the individuals in the sample were female with 76% living in urban areas and 43% in rural areas. The region with the highest number of inhabitants was Atlantic with 20% of the national population living there.

FIGURE A4. 1. HISTOGRAM AGE COLOMBIA QOLS 2008



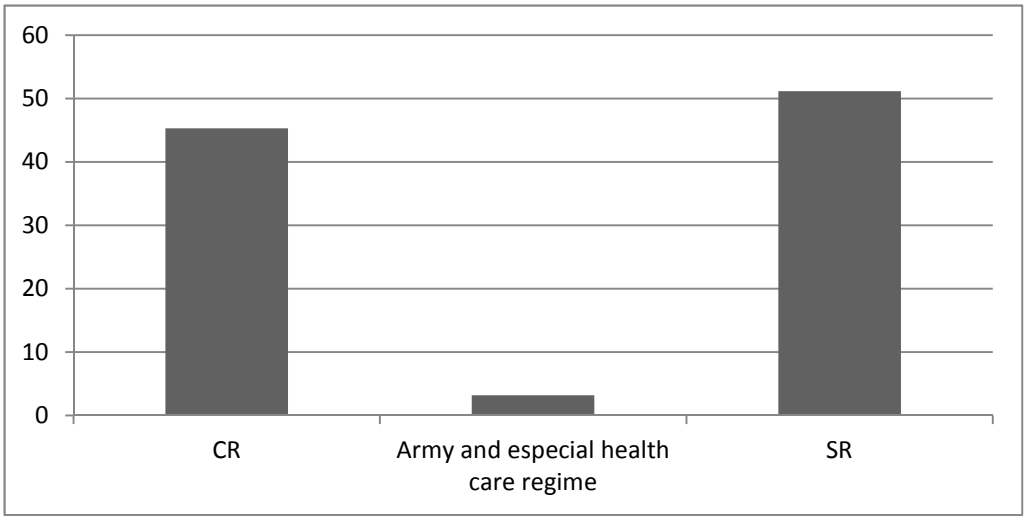
5% of individuals older than five years old did not have any level of education, with 34% of individuals with primary school and 35% with complete high school (Table A4.1).

TABLE A4. 1. EDUCATION LEVEL COLOMBIA QOLS 2008

	Percentage
Kinder garden	0.78
Primary School	34.14
High school	34.81
Technical degree	4.24
Technological degree	1.36
University degree	7.27
Graduate degree	1.38
No education	4.99

47% of individuals older than 12 years old referred that they did not work during the week prior to the interview and 17% were studying. In the case of health care insurance, 86% of individuals were insured with 51% in the SR and 45% in the CR (Figure A4.2)

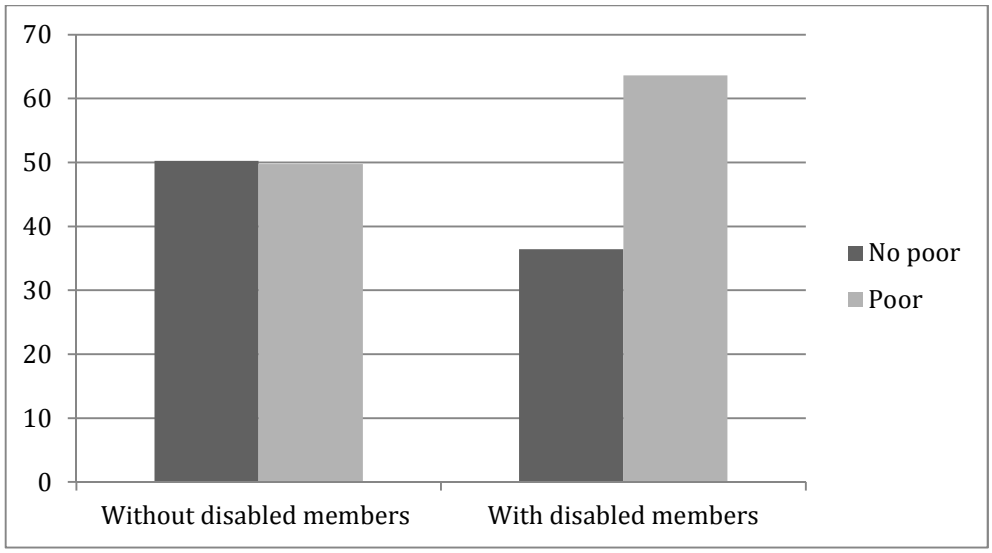
FIGURE A4. 2. HEALTH CARE REGIME COLOMBIA QOLS 2008



Questions related to disability were asked at the household level; therefore it was not possible to establish the characteristics of people with disabilities (age, gender, levels of education and economic activity). In general, 9.2% of the households referred to have at least one member living with impairments, with mental and physical impairments as the most prevalent (4.5% and 4.1%). Sensorial impairments did not have a high prevalence compared to physical or mental impairments, indeed, less than 1% of the households referred that at least one member of the household had a visual impairment; 1.2% had at least one member with hearing impairments and 1.2% with a speaking impairment.

63.6% of households with disabled members referred to consider themselves as poor (Figure A4.3) and 51% of those households considered that their level of income was not enough to cover their basic needs.

FIGURE A4. 3. POVERTY PERCEPTION AND PRESENT OF DISABLED MEMBERS COLOMBIA QOLS 2008



VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLE

The dependent variable was *perception of poverty* of a household. The question was asked to the head of the household. . This variable was dichotomous and took the value of one if the household was considered poor and 0 if not. According to the information provided in the survey, 51% of the households in Colombia in 2008 considered themselves as poor (Table A4.2).

TABLE A4. 2. POVERTY PERCEPTION COLOMBIA QOLS 2008

Poverty perception	Percentage
No	48.97
Yes	51.03

INDEPENDENT VARIABLES

1. *Characteristic members of the household*
   a. *Disability in the household:* Dichotomous variable that took the value of one if the household referred to have at least one member living with

any impairment. Questions on disability were asked at the household level and were:

In this household there is a person with disability that as a result of disease, illness, accident or birth has any of the following permanent conditions: a. Total blindness b. Total deafness c. Muteness d. Difficulty to move or walk for yourself e. Difficulty to take a shower, get dressed, or feed yourself f. Difficulty to go outside without help or by your own g. Difficulty to understand or learn

A variable was created in order to represent the presence of a member with disability in the household. If it was mentioned that any member of the household had one permanent condition, the variable took the value of one and zero in other case.

b. *Number of elderly members (older than 65 years old)*: Continuous variable that took values between 0 and 2 (Table A4.3).

TABLE A4. 3. NUMBER OF ELDERLY MEMBERS IN THE HOUSEHOLD COLOMBIA QOLS 2008

Older 65 years old	Percentage
0	80.52
1	14.56
2	4.93

c. Number of children in the household: Continuous variable that took values between 0 and 5. It represented the number of individuals younger than 12 years old per household (Table A4.4).

TABLE A4. 4. NUMBER OF CHILDREN IN THE HOUSEHOLD COLOMBIA QOLS 2008

Children household	Percentage
0	31.49
1	28.74
2	21.58
3	10.59
4	4.4
5	3.2

d. Number of working individuals per household: Continuous variable, which took values between 0 and 4. It represented that the person was older than 12 years old and was working with salary (Table A4.5).

TABLE A4. 5. WORKING INDIVIDUALS PER HOUSEHOLD COLOMBIA QOLS 2008

Working individuals per household	Percentage
0	11.47
1	38.49
2	33.45
3	11.49
4	5.11

e. Size of household: Continuous variable that represented the total size of the household. It took values between 1 and 20, with an average of 4.7 members per household.

2. *Urban:* Dichotomous variable, which took the value of one when the person lived in urban areas and 0 in rural areas.
3. *Region:* Dichotomous variables that represented each region in Colombia. Each variable took the value of one when the person lived in that region and 0 when not. The reference variable was Central region.
4. *Household head characteristics:*
   a. *Age head of the household:* Continuous variable that took values between 12 and 98. It represented the age of the head of the household. The average age was 47 years old.

b. *Age squared:* Continuous variable that took values between 144 and 9604.

c. *Sex head of the household:* Dichotomous variable that took the value of one if the head of the household was female and 0 if he was male. 73% of the population lived in households with a male head (Table A4.6).

TABLE A4. 6.SEX HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2008

	Percentage
Male head	73.02
Female head	26.98

d. *Level of education of head of the household:* 42% of the population lived in households, whose head had only completed primary school. 9.7% lived in households, whose head had no education. Only 2.4% of the population lived in households, whose head had a graduate degree (Table A4.7).

TABLE A4. 7. EDUCATION HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2008

Education head household	**Percentage**
Kinder garden	0.06
Primary	42.46
High school	32.36
Technique	4.08
Technologic	1.5
University	7.43
Post-graduate	2.41
None	9.7

e. *Working head:* Dichotomous variable that took the value of 0 if the head of the household was not working and one if s/he was working and earning a salary. 29% of the individuals lived in households, whose head was not working (Table A4.8).

TABLE A4. 8. WORKING HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2008

	Percentage
Head no working	28.79
Head working	71.21

5. *Poorest 40% according to the asset index*: Dichotomous variable that took the value of one if the person lived in the poorest 40% according to the asset index and 0 otherwise.

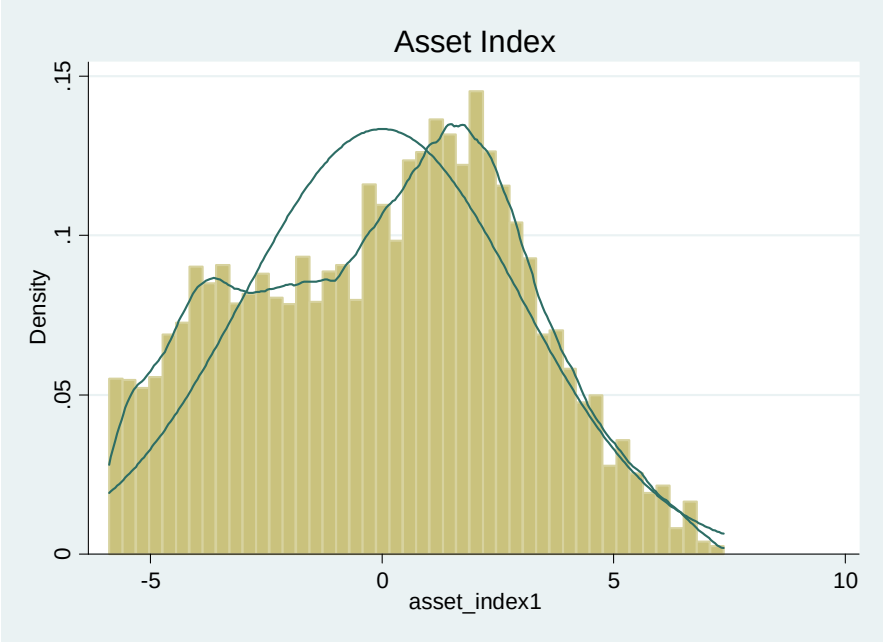
   a. *Asset index:* The first component explained the variance by 20.3%. The results of the first component are presented in table A4.9. Although, the values were small in magnitude, it is evident that the index increases when the household had better characteristics (walls material: bricks; floor materials: marble; public aqueduct; natural gas and public trash collection) and when the household had any asset. Figure A4.4 presents the distribution of the asset index and Figure A4.5 the contribution of each variable to the asset index in urban and rural areas.

TABLE A4. 9. FIRST COMPONENT ASSET INDEX COLOMBIA QOLS 2008

Variable	First Component
Washing Machine	0.1992
Fridge	0.1913
Blender	0.1782
Stove	0.1961
Electrical oven	0.1601
Microwave	0.1445
Heather	0.1395
TV	0.1585
DVD	0.1725
Stereo	0.1674
PC	0.1838
Vacuum	0.1086
Air conditioner	0.0643
Fan	0.0514
Motorcycle	0.0678
Car	0.1226
House or appartment	0.0567
TV subscription	0.2086
Internet	0.1513
Walls: Brick	0.1915
Walls: Adobe	-0.0408

Walls: Wood	-0.1152
Floor: Wood	-0.0477
Floor: cement	-0.0909
Floor: earth	-0.1519
Floor: Marmol	0.2139
Floor: Rubbish	-0.1316
Toilet: Indoor	0.2525
Toilet: Well	-0.1613
Toilet: Letrina	-0.0616
No toilet	-0.1419
Public rubbish collection	0.2569
Burn rubbish	-0.187
Aqueduct: Public	0.2297
Aqueduct: Communal	-0.1051
Aqueduct: River or rain	-0.1478
Aqueduct: Other	-0.0101
Aqueduct: Pit	-0.0737
Cooking: Electricity	0.0133
Cooking: Gas	0.1837
Cooking : Gasoline	0.0357
Cooking: Coal	-0.2389
Walls: Other material	-0.0352
Walls: Daub and wattle	-0.1241

FIGURE A4. 4. HISTOGRAM ASSET INDEX COLOMBIA QOLS 2008



6. *Type of ownership of the dwelling*:

   a. *Own the property:* Dichotomous variable took the value of one if the family owned the house where they were living and 0 if not. It

included the options of own the dwelling and own it but paying a mortgage.

b. *Rent the property*: Dichotomous variable that took the value of one if the family lived in a rented house or a flat and 0 otherwise.

c. *Other:* This variable included all other options of ownership of the dwelling where the household lives. It took the value of one if the dwelling where the family lived was occupied under these conditions and 0 if not.

7. *Food insecurity:* Dichotomous variable that took the value of one when at least one adult in the household was hungry, but did not eat for financial reasons (Table A4.10). This is considered to be moderate food insecurity according to the Food and Agriculture Organization of the United Nations (FAO).

TABLE A4. 10. FOOD INSECURITY COLOMBIA QOLS 2008

Food insecurity	Percentage
No	82.78
Yes	17.22

8. *Health insurance:*

a. *Subsidized regime*: Continuous variable that took the values between 0 and 17. The 67.3% of the population lived in a household with at least one member insured in the subsidised regime.

b. *Contributory and special health regimes*: Continuous variable that took values between 0 and 11 and represented the number of members of a household that were enrolled in the CR or the special health care regime.

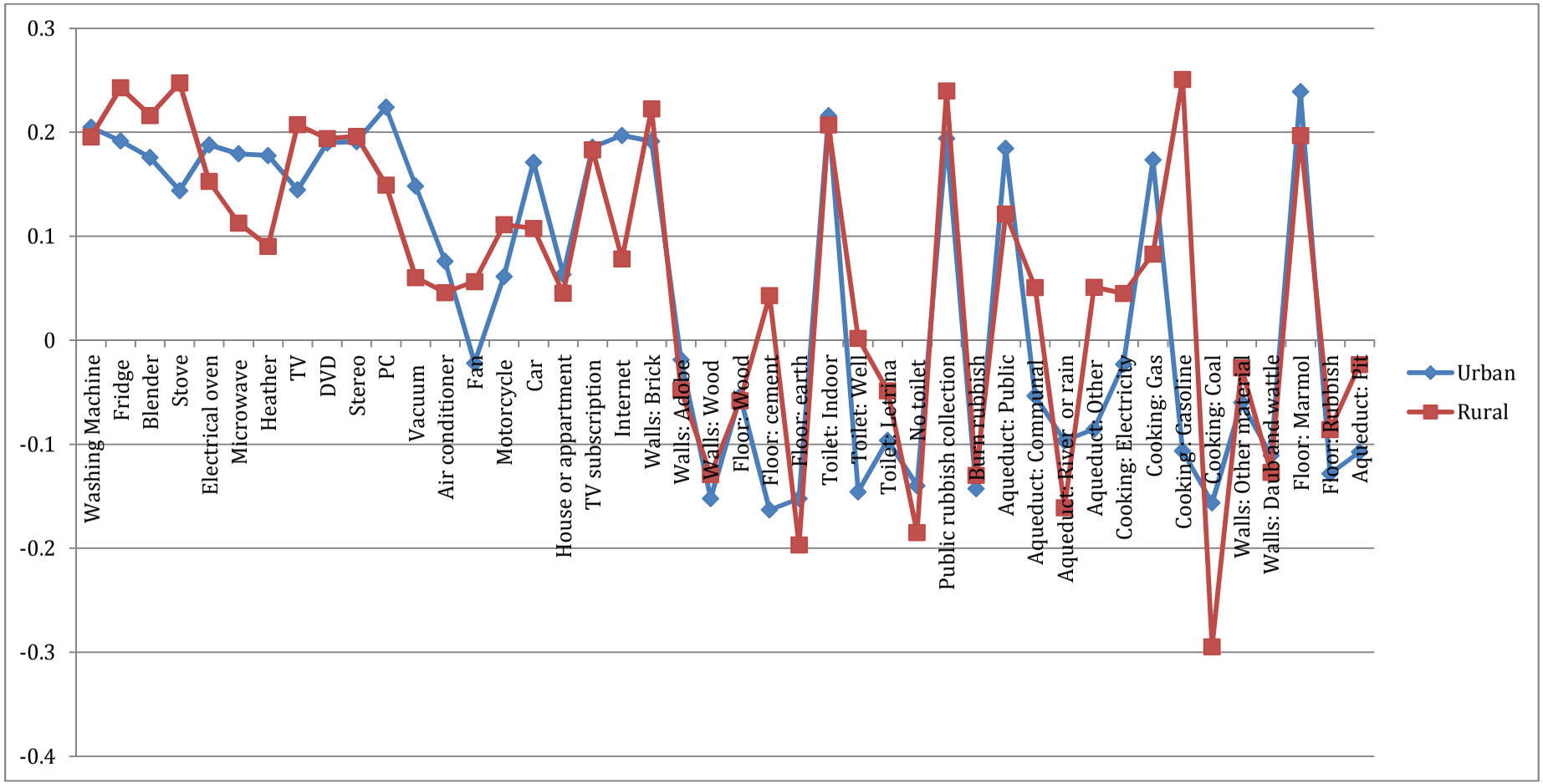
c. *No health care regime:* Continuous variable that took values between 0 and 12, it represented the number of members in a household without health care insurance.

9. *Social Assistance:* Dichotomous variable that took the value of one when at least on member of the household received a social assistance benefit (familias en accion) and 0 otherwise (Table A4.11).

TABLE A4. 11. SOCIAL ASSISTANCE COLOMBIA QOLS 2008

Social Assistance	Percentage
No	81.68
Yes	18.32

FIGURE A4. 5. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS COLOMBIA QOLS 2008



COLOMBIA QOLS 2010

DESCRIPTIVE STATISTICS

The average age was 29.8 years old, with a maximum of 102 (Figure A4.6); 51% of the individuals in the sample were female. 76.4% of the population were living in urban areas, with Atlantic region as the most populated region in Colombia, with 21.4% of individuals living there. In this year, 8.4% of the sample was illiterate, with 5.3% of individuals older than five years with no education and 39% with a level of education equal to high school (Table A4.12).

FIGURE A4. 6. HISTOGRAM AGE COLOMBIA QOLS 2010

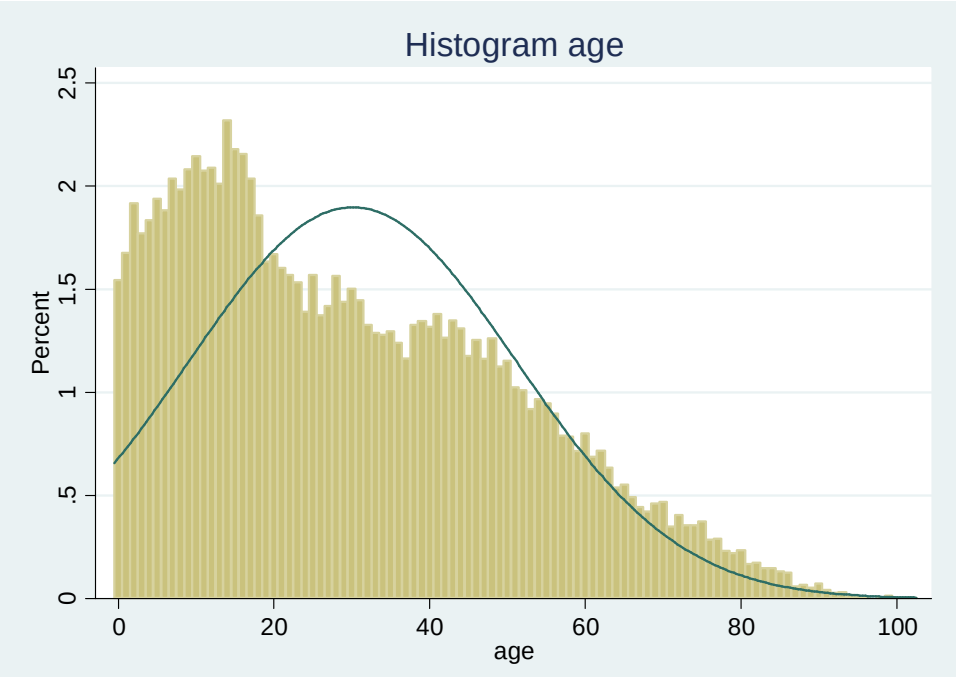
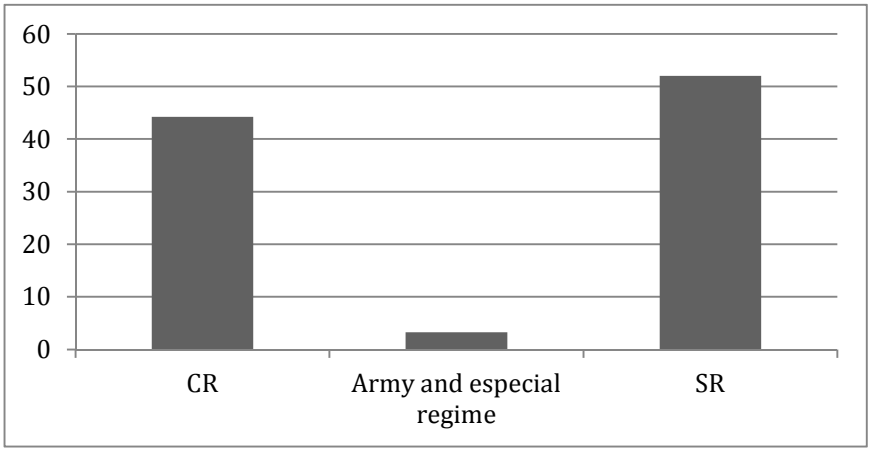


TABLE A4. 12. EDUCATION LEVEL COLOMBIA QOLS 2010

	Percentage
No education	5.32
Preschool	2.62
Primary school	35.36
High school	39.49
Technic degree	4.98
Technological degree	2.03
University	8.44
Graduate degree	1.77

46.7% of the population older than 12 years old were working, and 18% were studying. Of those who were working, 40% were self-employed. 89% of the individuals were insured by a health care company, with 52% in the SR and 44% in the CR (Figure A4.7).

FIGURE A4. 7. HEALTH CARE REGIME COLOMBIA QOLS 2010



In 2010, questions on disability were asked at the individual level. Therefore information about gender, age, education level and economic activity is possible to analyse. 4.2% of individuals referred to live with any impairment. 1.9% referred to live with a physical limitation and of those with impairments 34.6% mentioned that difficulties to walk were the ones that most affect them. The average age of people with impairments was 49.8 years old. Nevertheless, the average age of individuals with hearing impairments was 59 years old, and with learning

difficulties was 34 years. 50% of individuals with impairments were female. In the case of individuals with ADL limitation, 54.4% were female and in the case of individuals with speaking limitation 57% were male.

28.3% of individuals with any impairment were illiterate. 25.7% did not have any type of education and 44.6% had primary school (Figure A4.8). 17.2% of individuals living with impairments were working and 37% had a permanent impairment that limited their ability to work (Figure A4.9). 91.4% of individuals with impairments had an insurance company, with 59% enrolled in the SR and only 38% in the CR.

FIGURE A4. 8. EDUCATION LEVEL AND DISABILITY COLOMBIA QOLS 2010

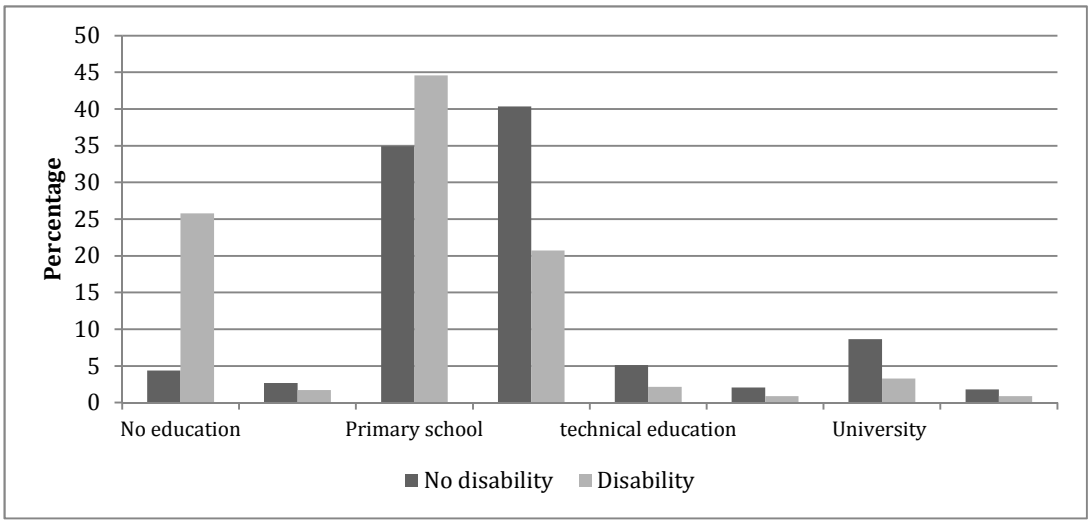
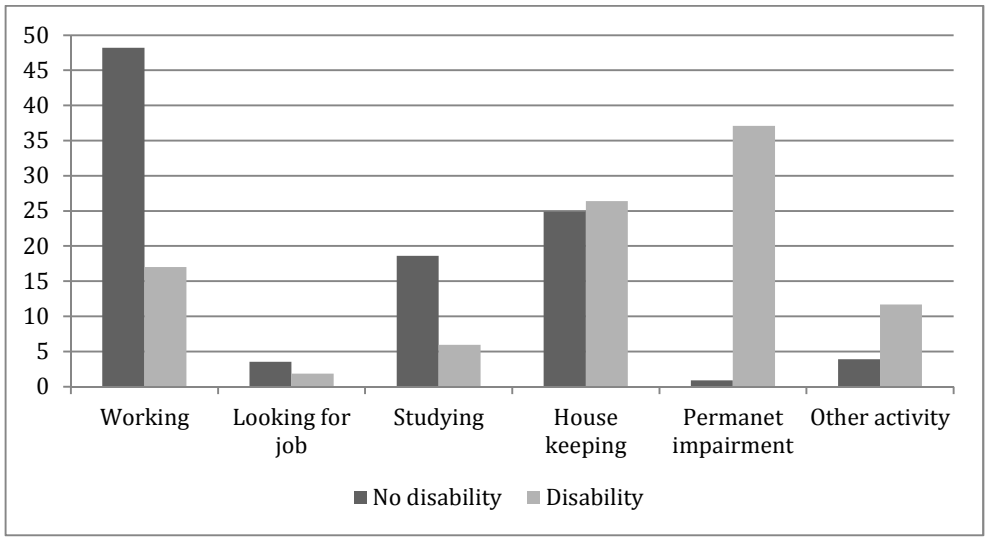


FIGURE A4. 9. ECONOMIC ACTIVITY AND DISABILITY COLOMBIA QOLS 2010



VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLE

The dependent variable was the *perception of poverty* of a household. As in 2008, this was a dichotomous variable that took the value of one when the head of the household considered that they were poor and 0 if not. In 2010, 47% of the population was living in households whose head considered they were poor (Table A4.13).

TABLE A4. 13. POVERTY PERCEPTION COLOMBIA QOLS 2010

Poverty perception	Percentage
Non poor	53.34
Poor	46.66

INDEPENDENT VARIABLES

1. *Characteristic members of the household*

    a. *Disability in the household:* Dichotomous variable that took the value of one if at least one member of the household had a disability. The question was asked at the individual level and it was:

> Do you have a permanent limitation for…?
>
> a. Walking or move around
> b. Use your arms and hands
> c. See, even when you are using glasses
> d. Hearing even when hearing aids
> e. Talking
> f. Understand and learn
> g. Establish relations with others as a result of mental or emotional problems
> h. Have a shower, get dress, feed yourself
> i. Other permanent limitation
> j. No limitation

As was done in the previous year a variable was created in order to represent the disability in the household. In 2010, 14% of the sample was living in a household with at least one member with disability (Table A4.14).

TABLE A4. 14. DISABILITY IN THE HOUSEHOLD COLOMBIA QOLS 2010

	Percentage
No disabled members	85.98
Disabled members	14.02

b. *Number of individuals older than 65 years in the household*: Continuous variable that took values between 0 and 4.

c. *Number of children in the household:* Continuous variable that took values between 0 and 5. It represented the count of individuals younger than 12 years old per household (Table A4.15).

TABLE A4. 15. CHILDREN IN THE HOUSEHOLD COLOMBIA QOLS 2010

Children household	Percentage
0	32.95
1	29.77
2	21.61
3	9.45
4	3.87
5 or more	2.36

   d. *Number of working individuals per household:* Continuous variable, which took values between 0 to 8 individuals. In addition, the person was older than 12 years old and was working and receiving a salary.

   e. *Size of household:* Continuous variable that represented the total size of the household. It took values between one and 17, with an average of 4.6 members per household.

2. *Area:* Dichotomous variable, which took value of one when the person lived in urban areas and 0 when they lived in rural areas.

3. *Region:* Dichotomous variables that represented each of the regions in Colombia. Each of them took the value of one when the person lived in that region and 0 when not.

4. *Household head characteristics:*

   a. *Age head of the household:* continuous variable that took values between 13 and 99. It represented the age of the head of the household, with an average age of 47.7 years old.

   b. *Age squared head of the household:* Continuous variable that took values between 169 and 9801.

c. *Sex head of the household:* Dichotomous variable that took the value of one if the head of the household was female and 0 if was a male. 69% of the population lived in households with a male head (Table A4.16).

TABLE A4. 16. SEX HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2010

	Percentage
Male head	69.52
Female head	30.48

d. *Level of education of head of the household:* 49% of the population lived in households, whose head had only completed primary school or s/he did not have any level of education. Only 2.5% of the population lived in households, whose head had post-graduate education (Table A4.17).

TABLE A4. 17. LEVEL OF EDUCATION HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2010

	Percentage
None	8.55
Primary School	40.34
High school	33.94
Technical education	4.96
Technological education	1.96
University	7.73
Post-graduate	2.51

e. *Working head of the household:* Dichotomous variable that took the value of 0 if the head of the household was not working and one if s/he was working and earning a salary. 28.4% of individuals lived in households, whose head of the household did not work (Table A4.18).

TABLE A4. 18. WORKING HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2010

	Percentage
Head: No working	28.43
Head: Working	71.57

f. *Head of the household with disability:* Dichotomous variable that took the value of one when the head of the household had disability and 0 otherwise (Table A4.19).

TABLE A4. 19. HEAD OF THE HOUSEHOLD WITH DISABILITY COLOMBIA QOLS 2010

	Percentage
No	95.21
Yes	4.79

5. *Poorest 40% according to the asset index*: Dichotomous variable that took the value of one if the person lived in the poorest 40% according to the asset index and 0 otherwise.

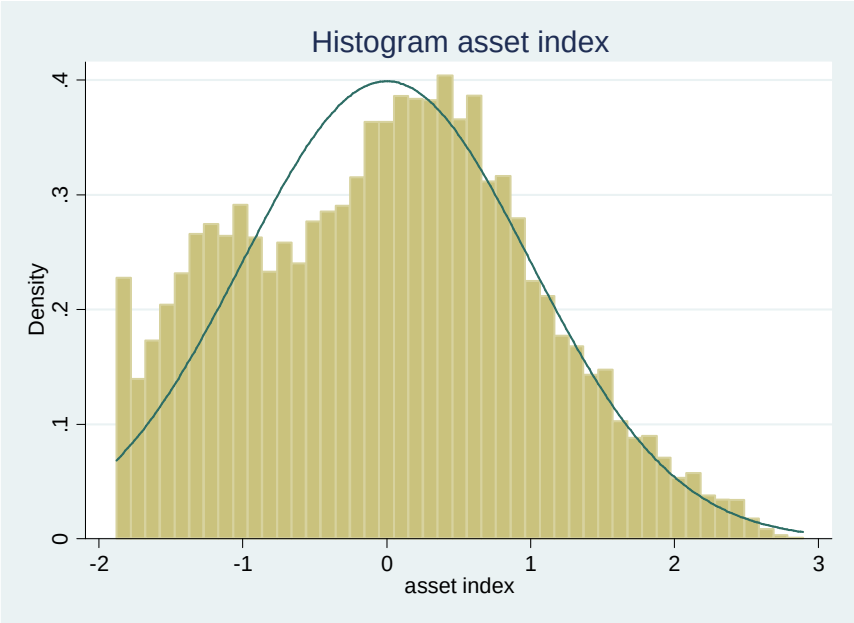
a. *Asset Index*: It was created using the same methodology than in previous surveys. The first component explained the variance of the variables by 18.3%. Even though, the values are not large, it is evident that the index increases when the household has better characteristics and the household has any asset the index increases (Table A4.20). Figure A4.10 presents the distribution of the first principal component and Figure A4.11 the contribution of each variable in the asset index for rural and urban areas.

TABLE A4. 20. FIRST COMPONENT ASSET INDEX COLOMBIA QOLS 2010

Variable	First component
Washing machine	0.1923
Fridge	0.1775
Bleeder	0.1659
Iron	0.1841

Stove	0.1843
Gas oven	0.158
Microwave	0.1533
Heather	0.1344
TV	0.1321
DVD	0.1575
Stereo	0.1507
PC	0.1986
Vacuum cleaner	0.1057
Air conditioner	0.0749
Fan	0.0453
MP3	0.1295
Play station	0.1046
Video camera	0.1179
Car	0.1225
Motorcycle	0.0648
House	0.0589
TV contract	0.2019
Internet connection	0.1811
Camera	0.1613
Walls material: brick	0.1666
Walls material: Adobe	-0.0419
Walls material: Daub and wattle	-0.1018
Walls material: Wood	-0.1019
Walls material: Prefabricated	0.0002
Walls material: Other	-0.041
Walls material: No walls	-0.0064
Floor: Carpet	0.0318
Floor: Wood	0.0289
Floor: Marble	0.2056
Floor: Cement and others	-0.2149
Toilet: Public system	0.2287
Toilet: Pit	-0.1358
Toilet: Without connection	-0.056
Toilet: Letrine	-0.0569
Toilet: No sanitary	-0.1168
Aqueduct: Public	0.2052
Aqueduct: Public source of water	-0.107
Aqueduct: Well	-0.0787
Aqueduct: Rain or river	-0.1164
Aqueduct: Other	-0.0063
Cooking: Electricity	0.0032
Cooking: Natural gas	0.1756
Cooking: Petrol	-0.0116
Cooking: Gas	0.0138
Cooking: Others	-0.2129
Rubbish collection: Public system	0.2308
Rubbish collection: Throwing river	-0.0939
Rubbish collection: burning	-0.1931
Rubbish collection: Informal services	-0.0114

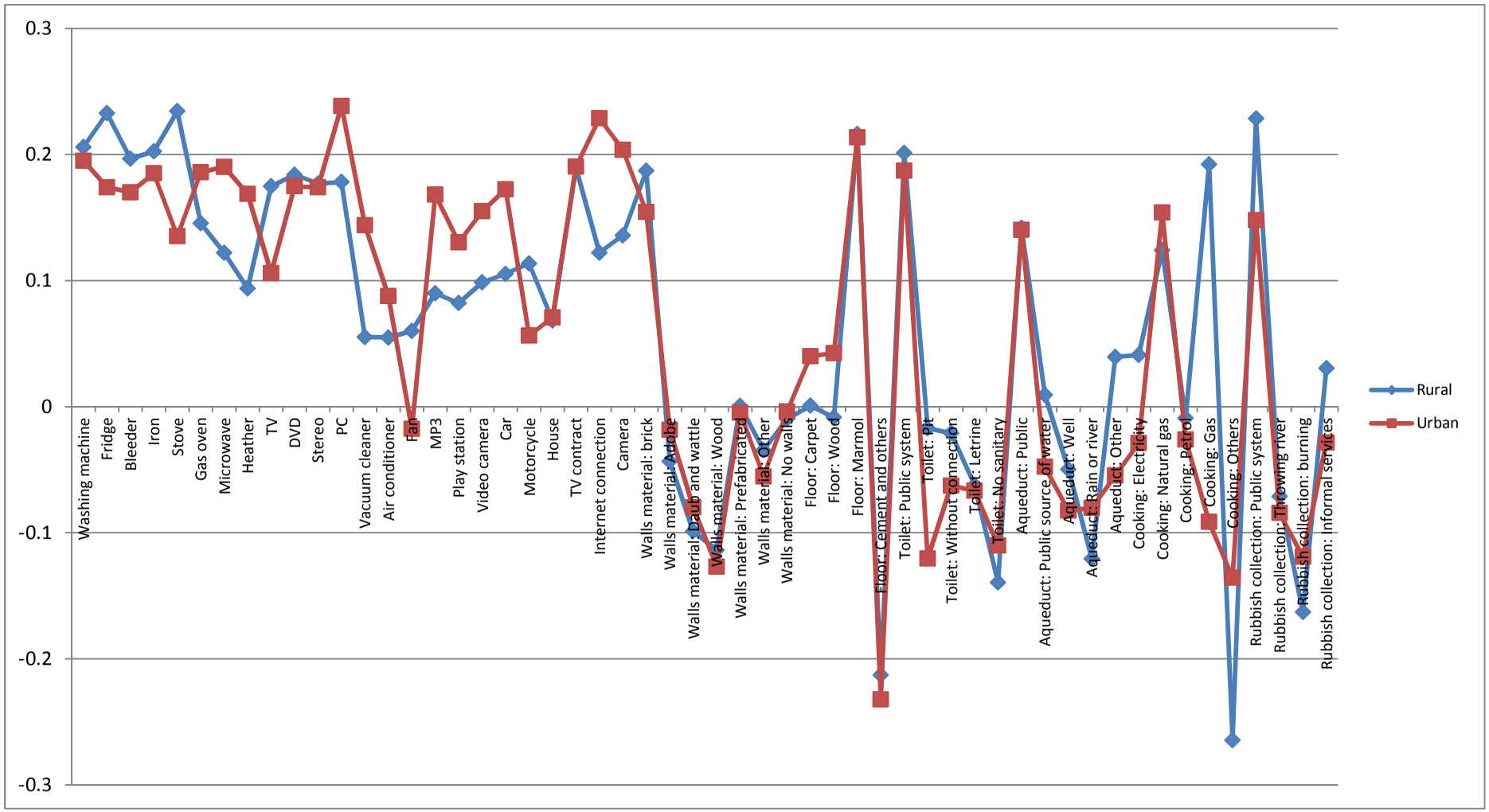
FIGURE A4. 10. HISTOGRAM ASSET INDEX COLOMBIA QOLS 2010



6. *Type of ownership of the dwelling:* Equal than last year
    a. *Own the property*
    b. *Rent the property*
    c. *Other*
7. *Food Insecurity:* Equal than last year
8. *Health care insurance:* Equal than last year
    a. *Subsidised regime*
    b. *Contributory regime*: Dichotomous variable that took the value of one when the person was enrolled in an insurance company in the contributory regimen and 0 otherwise.
    c. *Special regimens*
    d. *No health care*

9. *Social Assistance:*
    a. *Familias en accion:* Dichotomous variable that took the value of one when a member of the family was receiving this subsidy and zero if not.
    b. *Old age pension:* Dichotomous variable that took the value of 1 when a person older than 65 years old in a household was receiving this pension and zero in other cases.

FIGURE A4. 11. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS COLOMBIA QOLS 2010



COLOMBIA QOLS 2011

DESCRIPTIVE STATISTICS

The average age of the sample was 31 years old (Figure A4.12), 51% of the sample was female. 77% of the population was living in urban areas and 21% of the population was living in the Atlantic region. 7.8% of individuals were illiterate and 5% did not have any type of education (Table A4.21).

FIGURE A4. 12. HISTOGRAM AGE COLOMBIA QOLS 2011

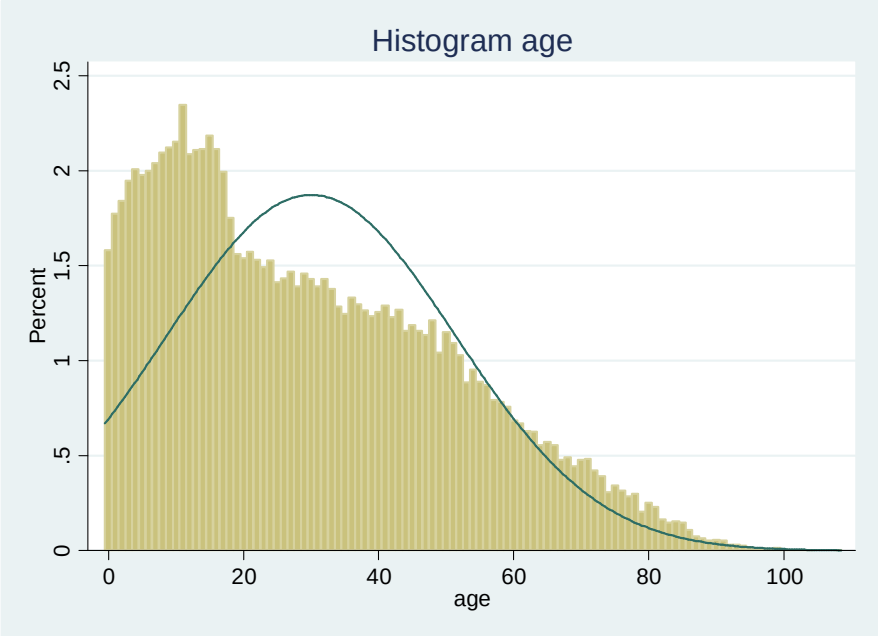
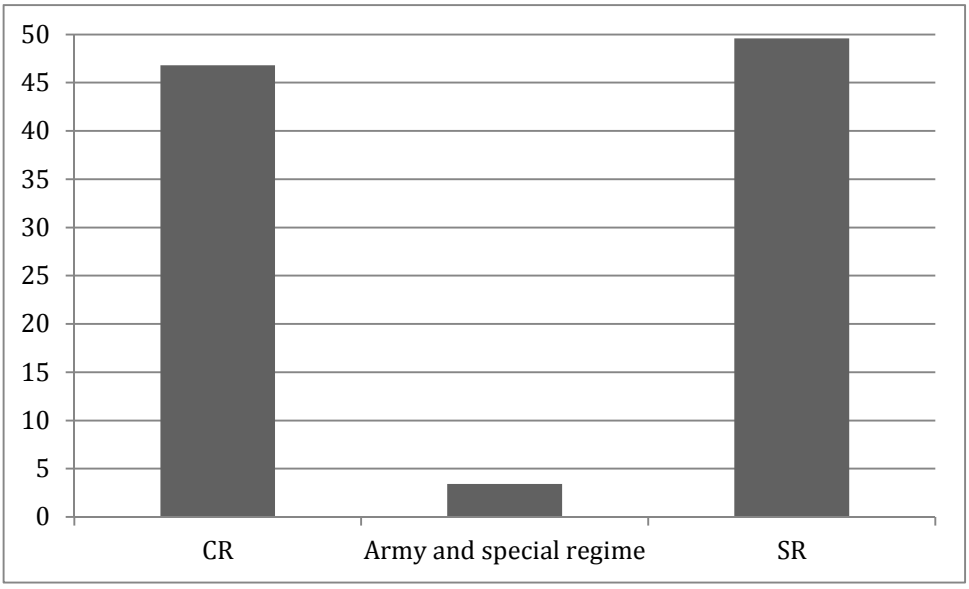


TABLE A4. 21. LEVEL OF EDUCATION COLOMBIA QOLS 2011

	Percentage
No education	4.91
Pre school	2.43
Primary school	35.16
High school	39.82
Technic education	4.67
Technological education	2.19
University	8.63
Graduate degree	2.2

48% of individuals older than 12 years old referred to work and 17.4% to study. Of those that were working, 37.5% were self-employed and 38% were employees. 90.3% of the sample had an insurance company, with 50% enrolled in the SR (Figure A4.13).

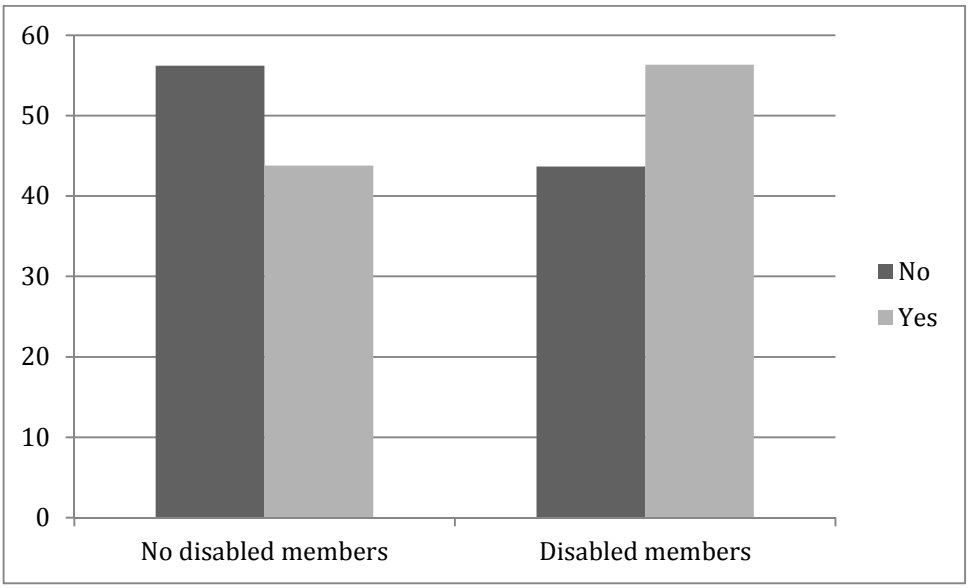
FIGURE A4. 13. HEALTH CARE REGIME COLOMBIA QOLS 2011



In this year questions on disability were asked at the household level, therefore, it was not possible to describe the sociodemographic characteristics of individuals with a disability.

9.4% of the households had at least one member with an impairment. 3.8% of the households referred to have at least one member with a physical limitation and 2.5% had mental or cognitive impairments. Of those households with disabled members 56.3% considered themselves as poor (Figure A4.14), a higher percentage than for households without disabled members.

FIGURE A4. 14. PERCEPTION OF POVERTY AND DISABILITY COLOMBIA QOLS 2011



VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLE

The dependent variable was the *perception of poverty* of a household. The question was asked to the head of a household and according to the information provided 45% of the households in Colombia considered themselves as poor in 2011 (Table A4.22).

TABLE A4. 22. PERCEPTION OF POVERTY COLOMBIA QOLS 2011

Poverty perception	Percentage
No	55.04
Yes	44.96

INDEPENDENT VARIABLES

1. *Characteristic members of the household*
    a. *Disability in the household:* Dichotomous variable that took the value of one if at least one member of the household had a permanent limitation. The question was asked at the household level and it was:

Does any member of this household have any permanent limitations (impairments) to:

a. Move or walk
b. Use their arms and hands
c. See, even when they are using glasses
d. Hearing, even using special hearing aids
e. Speaking
f. Learning or understanding
g. Establish relationships with others, as a result of mental or emotional problems
h. Bathing, dressing or feeding themselves
i. Other permanent impairment
j. No impairment

Using the answers given to these questions, a dichotomous variable was created at the household level, meaning that all individuals in a household took the value of one if there was a member with at least one limitation (or impairment) (Table A4.23).

TABLE A4. 23. DISABILITY IN THE HOUSEHOLD COLOMBIA QOLS 2011

Disability household	Percentage
No	90.61
Yes	9.39

b. *Number of individuals older than 65 years in the household:* Continuous variable that took values between 0 and 4 and it represented the count of individuals older than 65 years in the household.

c. *Number of children in the household:* Continuous variable that took values between 0 and 5. It represented the number of individuals younger than 12 years old per household (Table A4.24).

TABLE A4. 24. CHILDREN IN THE HOUSEHOLD COLOMBIA QOLS 2011

Children per household	Percentage
0	31.79
1	28.19
2	22.17
3	10.15
4	4.42
5	3.29

d. *Number of working individuals per household:* Continuous variable that took values between 0 to 5 individuals and it represented the number of individuals older than 12 years old, working and earning a salary in a household (Table A4.25).

TABLE A4. 25. WORKING INDIVIDUALS PER HOUSEHOLD COLOMBIA QOLS 2011

Working individuals per household	Percentage
0	9.99
1	38.46
2	33.15
3	12.37
4	4.21
5 or more	1.82

e. *Size of household:* Continuous variable that represented the total size of the household. It took values between 1 and 19, with an average of 4.7 members per household.

2. *Area:* Dichotomous variable, which took the value of one when the person lived in urban areas and 0 in rural areas.

3. *Region:* Dichotomous variables that represented each of the regions in Colombia. Each of them took the value of one when the person lived in that region and 0 when not.

4. *Household head characteristics:*

a. *Age head of the household:* Continuous variable that took values between 15 and 104. It represented the age of the head of the household. The average age was 47 years old.

b. *Age squared head of the household:* Continuous variable that took values between 225 and 10816.

c. *Sex head of the household:* Dichotomous variable that took the value of one if the head of the household was female and 0 if he was a male. 70% of the population lived in households, whose head was male (Table A4.26).

TABLE A4. 26. SEX HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2011

	Percentage
Male head	70
Female head	30

d. *Level of education of head household:* Dichotomous variables that took the value of one if the person was living in a household, whose head had that level of education and zero in other cases. 40% of the population lived in households whose head had only completed primary school or s/he did not have any type of education. Around 11% of the population lived in households, whose head had university education or more (Table A4.27).

TABLE A4. 27. LEVEL OF EDUCATION HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2011

Level of education head of the household	**Percentage**
None	7.67
Pre school	0.06
Primary School	40.06
High school	34.6
Technical education	4.48
Technological education	2.11
University	7.71
Graduate degree	3.32

e. *Working head of household:* Dichotomous variable that took the value of one if the person was living in a household, whose head was working and earning a salary and zero if not. In 2011, around 26% of individuals

lived in households whose head did not work and received any salary (Table A4.28).

TABLE A4. 28. WORKING HEAD OF THE HOUSEHOLD COLOMBIA QOLS 2011

	Percentage
Head: No working	25.6
Head: Working	74.34

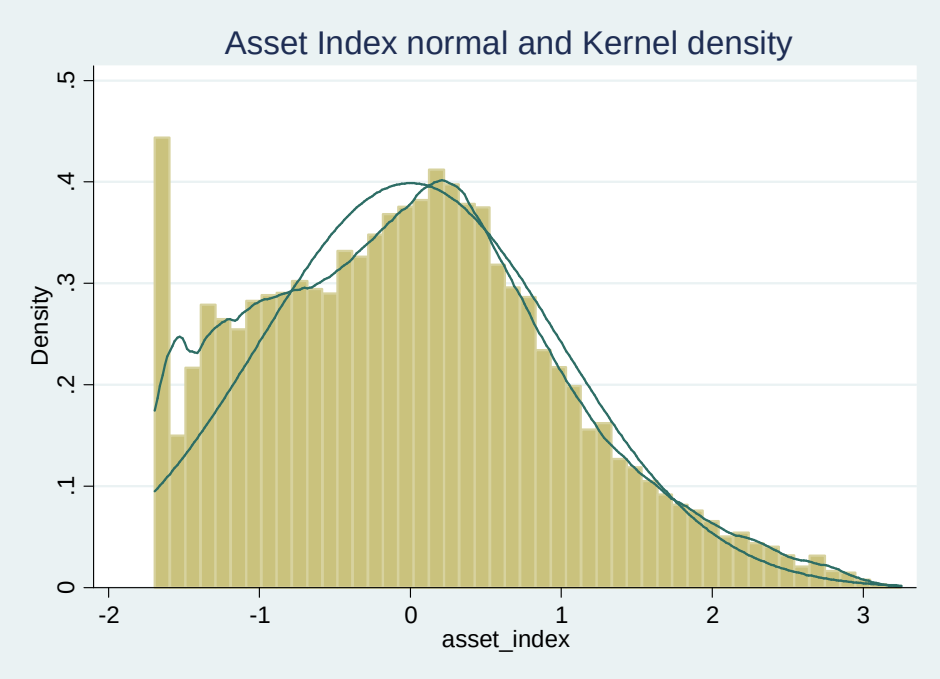
5. *Poorest 40% according to the asset index*: Dichotomous variable that took the value of one if the person lived in the poorest 40% according to the asset index and 0 otherwise.
   a. Asset Index: It was created using the same methodology than in the previous surveys and years. The first component explained the variance of the variables by 21.37%. The results of the first component are presented in Table A4.29. The values of the first component were not large, however as expected the index increased when the household had any of the assets and characteristics associated with good characteristics of the dwelling. Figure A4.15 presents the distribution of the asset index and Figure A4.16 the contribution of each variable to the asset index in rural and urban areas.

TABLE A4. 29. FIRST COMPONENT ASSET INDEX COLOMBIA QOLS 2011

Variable	First component
Washing Machine	0.2062
Fridge	0.2011
Blender	0.1801
Iron	0.1948
Stove gas	0.2051
Electrical oven	0.1694
Microwave	0.1711
Heather	0.1381
TV	0.1536
DVD	0.1661
Stereo	0.1604
PC	0.2147
Vacuum cleaner	0.1128
Air conditioner	0.0932

Fan	0.077
Stereo	0.1312
Play station	0.1187
Video camera	0.1274
Car	0.1442
Bike	0.0828
House or apartment	0.0552
TV Subscription	0.2061
Internet	0.1969
Digital camera	0.1765
Walls: Brick	0.1837
Walls: Adobe	-0.0634
Walls: : Daub and wattle	-0.1017
Walls: Wood	-0.1098
Walls: Other materials	-0.0271
Floor: Marble	0.2111
Floor: Cement	-0.1101
Floor: Earth or sand	-0.1387
Aqueduct: Public	0.1976
Aqueduct: Communal	-0.0952
Aqueduct: Well	-0.0735
Aqueduct: Rain or river	-0.1196
Aqueduct: Others	0.012
Rubbish collection: Public system	0.2312
Rubbish collection: Burn or bury	-0.1743
Rubbish collection: Throw to river	-0.1065
Cooking: Electricity	0.0013
Cooking: Natural gas	0.1853
Cooking: Propane gas	0.0368
Cooking: Coal	-0.2256

FIGURE A4. 15. HISTOGRAM ASSET INDEX COLOMBIA QOLS 2011



10. Type of ownership of the dwelling: Equal than last year

a. *Own the property*

b. *Rent the property*

c. *Other*

11. Food Insecurity: Equal than last year

12. *Health care insurance:* Equal than last year

a. Subsidised regime

b. Contributory regime: Dichotomous variable that took the value of one when the person has a health care insurance in the contributory regimen and 0 otherwise.

c. Special regimens

d. No health care

13. *Social Assistance:* Equal than last year

    a. *Familias en accion*

FIGURE A4. 16. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS COLOMBIA QOLS 2011

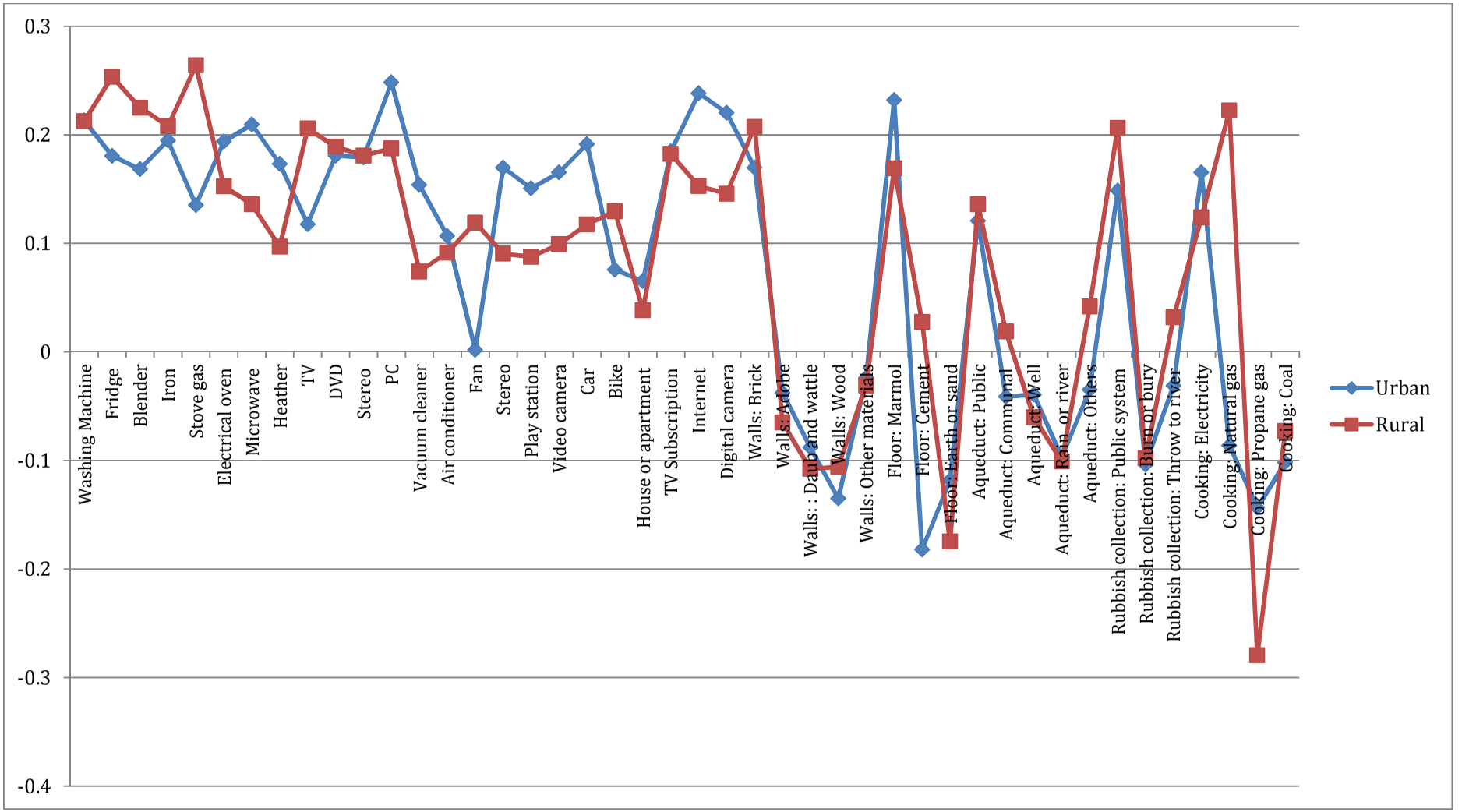
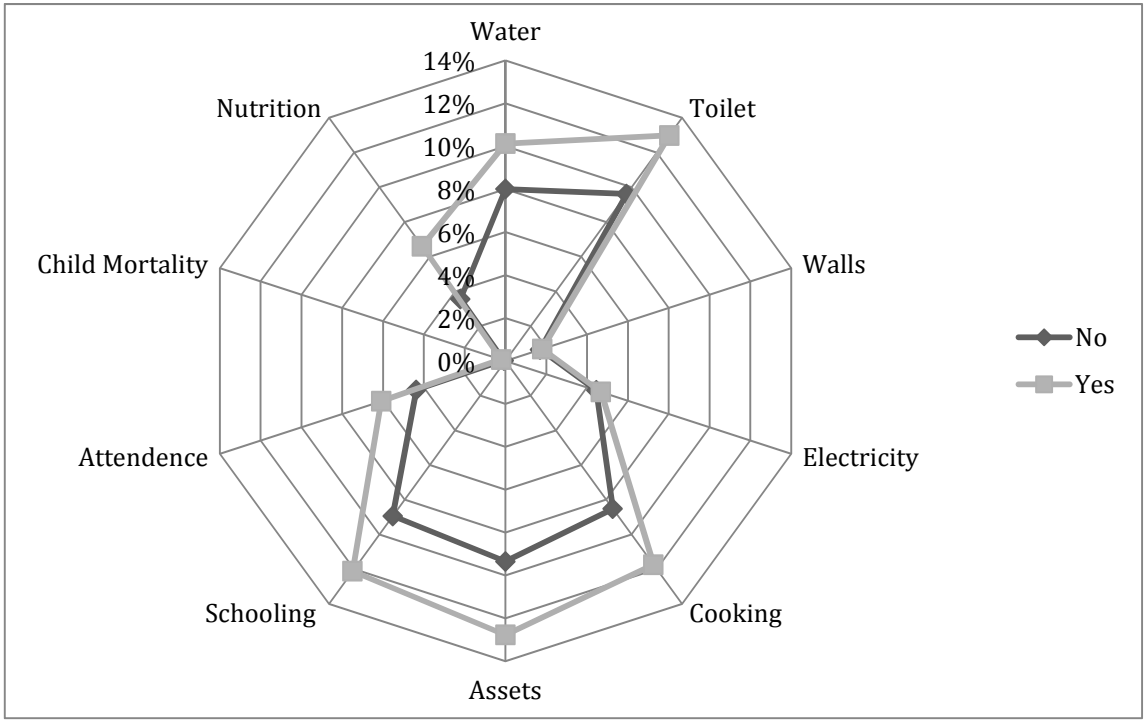


TABLE A4. 30. DIMENSIONS, INDICATORS AND WEIGHTS COLOMBIA MULTIDIMENSIONAL POVERTY ANALYSIS

Dimension	Indicator	Definition		Weight
Health	Child mortality	Any child has died in the family	Is the result of the question related to ever child alive and current child alive	1/6
	Nutrition	Has says of no food due to lack of money		1/6
Education	Years schooling	Number of household members older than 12 that have at least than six years of schooling (primary school)		1/6
	Child school attendance	Any school child who is not assisting to school	Older than 6 younger or equal to 15	1/6
Living Standard	Electricity	If the dwelling has no electricity		1/18
	Water	The household does not have access to safe drinking water such as aqueduct.	Deprive if : the household has access to water by well with or without pump, rain water, river, creek, spring or bottled or bagged water	1/18
	Sanitation	The household sanitation is not improved or in shared with other households	Deprived if: Toiled not connected to a sewage drain or latrine; toilet connected to a septic tank, no sewerage. Also, if the sanitation services are shared with other households	1/18
	Walls material	Deprived if the household has prefabricate, clay brick, zinc walls or no walls.		1/18
	Cooking fuel	The household does not have a place to cook, or cooks with wood or mineral coal	Deprived if firewood, wood, discarded material, mineral coal, others. No deprived if electrical, natural gas, gas in cylinder petroleum	1/18
	Asset ownership	The household does not own more than one assets of the following list: TV, blender, fridge, microwave, oven, washing machine PC or car	It is always not deprive if the household has a car	1/18

FIGURE A4. 17. CENSORED HEADCOUNT HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS COLOMBIA MULTIDIMENSIONAL POVERTY ANALYSIS



APPENDIX 5
COSTA RICA

SOCIAL PROTECTION SYSTEM

Costa Rica was classified by Mesa-Lago (1991) as an intermediate country in the development of the social security systems in LA. It was the only intermediate country that after a couple of decades reached similar characteristics to the pioneer countries, although economic growth and industrialization were not as good as in other LA countries. The development of the social security system in Costa Rica started in the 1940s. It was influenced by high levels of democracy that existed since the beginning of the 20th century, more than for the levels of industrialization (Huber et al., 2006, Segura-Ubiergo, 2007).

SOCIAL INSURANCE

In 1941, during the government of Rafael Calderon Guardia the *Social Insurance Institute* (Instituto de Seguros Sociales-SII) was created. Its main function was to provide universal access to health-maternity and pension programmes (Haggard and Kaufman, 2008, Juliana Martínez Franzoni et al., 2012, Segura-Ubiergo, 2007). All employees working in the public and private companies had to be enrolled in the system. Contrary to what happen in most LA countries, the expansion of coverage in Costa Rica was a bottom-up expansion, starting with all types of workers and followed by their families. The system was less fragmented than in other countries, and the expansion was not related to type of occupation. In addition, the creation of a basic floor of benefits for low and low-middle salaried

population was one important characteristics of the system (Juliana Martínez Franzoni et al., 2012).

No major reforms were implemented during the 1950s and only in 1961, the new constitution defined that the *Caja Costarricense del Seguro Social* (CCSS) was the only institution able to administrate and control social security in the country (Juliana Martínez Franzoni and Mesa-Lago, 2003). Universal coverage became the major objective of the new system. Despite the existence of strategies to guarantee universal access to social security, objectives were not fulfilled and in 1971 another reform was implemented. The new reform established that all hospitals should be transferred to the SII, aiming to achieve universal coverage and standardized care (Haggard and Kaufman, 2008, Huber, 1996, Juliana Martínez Franzoni et al., 2012, Segura-Ubiergo, 2007).

The expansion of the coverage in health care was the result of the long periods of democracy and political competition. Primary health care was provided to poor populations in rural and urban areas by the Ministry of Health. Additionally, poor populations who could not contribute to the system were covered by the SII (Mesa-Lago, 1997). Contrary to what happen in other LA countries, in Costa Rica, political parties competed for the median voter and considered the needs of the whole population. Improvements in social indicators such as life expectancy; mortality rates and illiteracy were the result of the improvements in the provision of social services to the whole population (Juliana Martínez Franzoni et al., 2012, Segura-Ubiergo, 2007).

By the end of 1970s, the coverage of the pension system was almost universal. The existence of contributory and non-contributory pensions was the main reason of universal coverage. In the contributory system public PAYGO schemes covered almost half of the active labour force. This system was administrated by social insurance funds and provided pension for old-age, survivors and disability (Kritzer, 2000). Non-contributory pension covered old-age individuals, who did not contribute to the system or did not fulfil the criteria for retirement (Juliana Martínez Franzoni and Mesa-Lago, 2003, Mesa-Lago, 1997).

Benefits in the pension system were distributed unequally among the population. During the 1980s, more than 15 special pension regimes covered employees in the public sector and provided different benefits. Those benefits were funded by the national budget and had a negative impact on the distribution of the system. Indeed, benefits in the pension system were regressive distributed (Juliana Martínez Franzoni and Mesa-Lago, 2003).

Contrary to what happened in most LA countries, Costa Rica did not drastically reform the social security system after the crisis of the 1980s or as a result of the pressure of international agencies. The purpose of the reforms was to increase coverage of the pension and the health care systems, with an emphasis in universality and solidarity. The participation of the private sector was allowed, but the role of private companies was not crucial to operate the systems (Juliana Martínez Franzoni and Mesa-Lago, 2003).

The objective of the pension reforms in 1995 and 1996 was to standardize benefits for workers in the public sector. Both reforms established a mandatory

contribution to the CCSS by public workers. Only in 2001 the country introduced a new pension system, which included four pillars. The first pillar was a public one that considered pensions for disability, old age and survivors. The second pillar was a private regime with an individual capitalization account. The third pillar was a complementary or voluntary regime and finally the last one was a non-contributory pension system (Juliana Martínez Franzoni and Mesa-Lago, 2003).

Currently, the pension system is a mixed model, with the integration of public and private regimes. The public regime has the main function to provide a monthly income to people with permanent or temporal disabilities and to the elderly population. It includes a solidarity mechanism that transfers the resources from active and young populations to inactive and elderly populations. After the reform in 2001 public pensions changed to a Collective Partial Capitalization (CPC), with scaled premium (Kritzer, 2000, Juliana Martínez Franzoni and Mesa-Lago, 2003). The system enrols formal and informal sector workers. A mandatory contribution is made by workers in the public and private companies. In this case, the employee, the employer and the State contribute to the system. Furthermore, independent workers and self-employed can make a voluntary contribution to the system and the State subsidies a percentage of the final contribution according to the type of job the person does (Juliana Martínez Franzoni and Mesa-Lago, 2003).

Three types of pensions are offered by the public system: old-age, disability and survivor. The first type is granted to people older than 65 years, who contributed to the system for at least 20 years. Disability pension is given to people, who as a result of a disability are unable to work, and finally, survivor pensions are granted

to dependents when the pensioner dies. The final amount pay to the pensioner depends on the average salary the person earned in the previous 5 years. In the case of disability pensions, after a medical evaluation and qualification of the level of disability the person will obtain 60% of the average salary earned in the last 5 years. Additionally, if the person with disability works, the final amount payable would be a 3% of a complementary old-age pension (Juliana Martínez Franzoni and Mesa-Lago, 2003).

The private regime includes an individual capitalization account, which is mandatory for all formal workers and which main objective is to complement the pension provided by the public regime. Furthermore, employees and the employers should contribute to the system. Half of the employer contribution and full employee contribution goes to the public sector, the other half goes to the individual account (Huber and Stephens, 2005). The contribution to the pension systems is 10% of the earnings of the employee; the employers should pay an additional contribution and a termination indemnity to cover if the employee becomes unemployed. Insurance that covers disability and survivors are available with an extra cost. In the private system, 10% for administrative costs is charged by private pension plan operators, whose main function is to manage individual accounts (Kritzer, 2000).

The reform to the health care system started after 1995. The purpose of this reform was to change the mechanism of service provision and to improve the mechanism to fund health care. The enrolment to the health care system is achieved by three mechanisms. The first includes a mandatory contribution by

formal workers, a voluntary contribution by the self-employed, and a contribution by pensioners. The second includes the enrolment of family members of people contributing to the system, and the last enrolment mechanism includes populations who do not contribute to the system, because they have private insurance. The State enrols poor and vulnerable populations, who do not have the ability to pay (Juliana Martínez Franzoni and Mesa-Lago, 2003).

Only workers in the formal labour sector with a mandatory contribution have access to monetary benefits. Self-employed and other insured populations do not have access to this type of benefit. However, all groups have access to the same type of health care services regardless their ability to pay (Juliana Martínez Franzoni and Mesa-Lago, 2003). Although the reforms have extended the coverage to poor populations, problems related to quality, real access and waiting lists go against the principles and objectives of the system.

SOCIAL ASSISTANCE

The non-contributory pension system was created in 1974. The main objective was to provide protection to poor elderly populations that were not covered by the contributory pension system. Beneficiaries did not fulfil the criteria to obtain a pension in the contributory regime. Indeed, they were poor or earned a monthly income lower than the cost of a basic food basket, were older than 65 years old or had lost more than 66% of their earning capacity (Juliana Martínez Franzoni and Mesa-Lago, 2003).

The economic and health conditions of individuals who receive a non-contributory pension are evaluated periodically. Only people with cerebral palsy in poor families get a life time pension. The pension is equivalent to 37% of the minimum pension in the contributory regime, and the number of pensions available depends on State resources (Juliana Martínez Franzoni and Mesa-Lago, 2003). In addition, a family allowance is given to families of children with disability under 18 years old.

In 2003, the non-contributory pension system was reformed, establishing that the benefits should be more than half of the minimum pension in the contributory system (Huber and Stephens, 2005). In fact, the monthly contribution that is transferred is equivalent to 56.85% of the average contributory pension.

COSTA RICA CENSUS 2000

DESCRIPTIVE STATISTICS

The average age was 27.4 years old (Figure A5.1). 50.1% of individuals were female, with 59% of the population living in urban areas. 38% of individuals were living in the Central Region. In 2000, the illiterate rate was 8.7% with an average level of education of primary school (Table A5.1).

FIGURE A5. 1. HISTOGRAM AGE COSTA RICA 2000

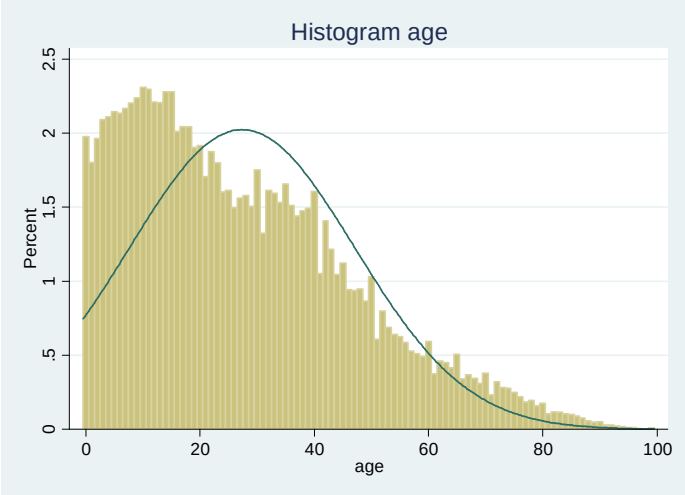


TABLE A5. 1. EDUCATION LEVEL COSTA RICA 2000

	Percentage
None	7.16
Pre-school	3.19
Primary School	52.96
Secondary academic	22.6
Secondary vocational/technical	2.5
Technical college	1.44
University	10.15

44.4% of the population older than 12 years old were working and 15.8% were studying. Of those who were working 85% were working in the private sector, with 19.3% being self-employed. 43.4% of the population were enrolled into the social security system as beneficiaries of a working individual (Table A5.2).

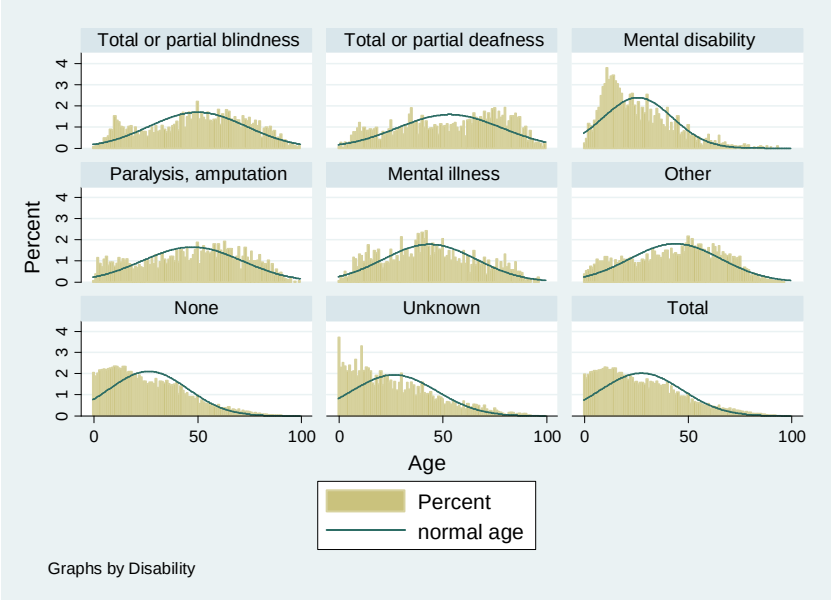
TABLE A5. 2. SOCIAL SECURITY COSTA RICA 2000

	Percentage
Salaried worker	18.74
Own-account or by contract	6.58
Pensioner	3.92
Family worker	43.38
State employee	8.29
Other	0.76
None	18.33

5.3% of the population referred to live with an impairment, with visual impairment as the most prevalent (1.63%). The average age of individuals with

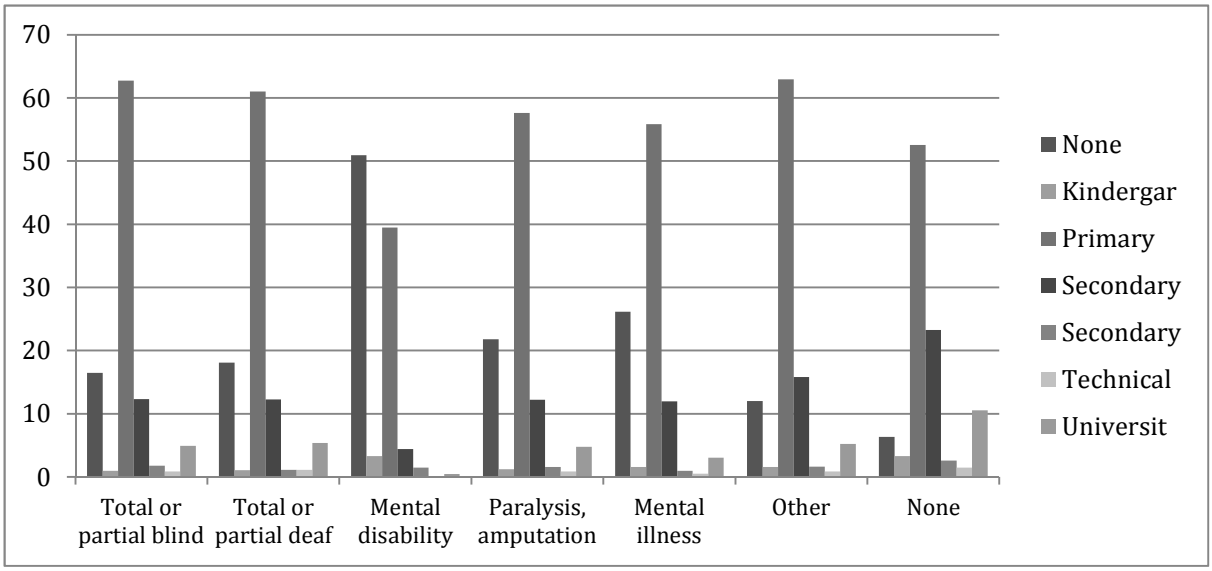
impairments was 45.4 years old. Nevertheless, the average age of people with hearing impairments was 53 years and for people with mental disabilities was 25 years (Figure A5.2).

FIGURE A5. 2. HISTOGRAMS AGE BY DISABILITY GROUPS COSTA RICA 2000



51.3% of individuals with any impairment were male. In all cases, the proportion of males was higher than for females. 21% of individuals with disabilities were illiterate, with an illiterate rate of 58.4% for individuals with mental disabilities. The level of education of people living with impairments was lower than people without them (Figure A5.3). Indeed, the percentage of people without education increases in all the cases, and for people with mental disabilities was 51%. The percentage of individuals with impairments working was at least 10% lower than for people without impairments.

FIGURE A5. 3. LEVEL OF EDUCATION AND TYPE OF IMPAIRMENT COSTA RICA 2000



VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLE

Unsatisfied basic needs: Variable that represented if a household had or not unsatisfied basic needs. The variable took values between zero and four. Zero represented those household with all their basic needs satisfied. Four represented those households with four unsatisfied basic needs.

According to the ECLAC, the index of UBN was constructed using information from four dimensions:

1. Access to dwelling
2. Access to basic sanitary services
3. Access to education
4. Economic capacity of the household

Around 60% of the population lived in households with all their basic needs satisfied. Less than 1% lived in households with four basic needs unsatisfied (Table A5.3).

TABLE A5. 3. UNSATISFIED BASIC NEEDS COSTA RICA 2000

UBN	Percentage
No deficiencies	60.16
One deficiency	25.42
Two deficiencies	9.94
Three deficiencies	3.57
Four deficiencies	0.91

INDEPENDENT VARIABLES:

1. *Household Characteristics:*

   a. *Disability household:* This variable was created using the information of the follow question:

> Do you have a permanent impairment such as…?
>
> a. Total or partial blindness
> b. Total or partial deafness
> c. Mental retardation
> d. Paralysis or amputation
> e. Mental disorders
> f. Other…?

This question was asked to all members of the household or collective dwellings (institutions and prisons). The variable disability in the household represented the presence of at least one member with disability in the household (Table A5.4).

TABLE A5. 4. DISABILITY IN THE HOUSEHOLD COSTA RICA 2000

	Percentage
Without members with disability	81.83
With members with disability	18.17

   b. *Number of individuals older than 65 years in the household:*

Continuous variable that represented the number of individuals

older than 65 years in a household. It took values between 0 and 2 (Table A5.5).

TABLE A5. 5. ELDERLY HOUSEHOLD COSTA RICA 2000

Number of older 65 years	Percentage
0	85.97
1	10.46
2 or more	3.57

c. *Number of members younger than 12 years:* Continuous variable that represented the number of individuals younger than 12 in each household. It took values between 0 and 5 (Table A5.6).

TABLE A5. 6. NUMBER OF CHILDREN HOUSEHOLD COSTA RICA 2000

Number of members younger than 12 years	Percentage
0	31.84
1	27.58
2	22.82
3	11.32
4	4.12
5 or more	2.32

d. *Number of working individuals per household:* Continuous variable, whose values were between 0 to 5 individuals. This variable represented the number of individuals older than 12 years that were working the week before the reference date of the Census (Table A5.7).

TABLE A5. 7. WORKING INDIVIDUALS PER HOUSEHOLD COSTA RICA 2000

Number of working individuals	Percentage
0	12.54
1	46.18
2	26.19
3	9.99
4	3.43
5 or more	1.66

e. *Size of household:* Continuous variable that took values between 1 and 29, with an average of 4.8 individuals per household.

2. *Area:* Dichotomous variable that took the value of one when the person was living in urban areas and 0 in rural areas.

3. *Region:* Dichotomous variables that represented each of the regions in Costa Rica. Each of them took the value of one when the person lived in that region and 0 when not. Brunca was the reference variable.

4. *Head of household characteristics:*

    a. *Age head of the household:* Continuous variable that represented the average age of the head of the household, the average age was 45 years, and it took values between 14 and 99.

    b. *Age squared head of the household:* Continuous variable that represented the square of the age of the head of household. It took values between 196 and 9801.

    c. *Sex head of the household:* Dichotomous variable that took the value of one if the head of household was female and 0 if he was a male. 80.3% of the population lived in a household, whose head was male (Table A5.8).

    TABLE A5. 8. SEX HEAD OF THE HOUSEHOLD COSTA RICA 2000

	Percentage
Male head	80.3
Female head	19.7

    d. *Level of education head of the household:* Dichotomous variables that took the value of one if the person was living in a household, whose head had a specific level of education and 0 otherwise (Table A5.9).

TABLE A5. 9. EDUCATION HEAD OF THE HOUSEHOLD COSTA RICA 2000

Education Head	Percentage
No education	6.7
Primary School	54.34
Secondary School	22.09
Secondary Vocational	2.30
Technical- College	1.56
University	13.04

e. Working head of household: Dichotomous variable that took the value of 0 if the person was living in a household, whose head was not working and receiving a salary in the last week and one if was working and earning a salary (Table A5.10).

TABLE A5. 10. WORKING HEAD OF THE HOUSEHOLD COSTA RICA 2000

	Percentage
No working head	29.77
Working head	70.23

f. *Head with disability*: Dichotomous variable that took the value of one if the person was living in a household, whose head had any impairment (Table A5.11).

TABLE A5. 11. HEAD OF THE HOUSEHOLD WITH DISABILITY COSTA RICA 2000

	Percentage
Head without impairment	92.5
Head with impairment	7.5

5. Poorest 40% according to the asset index: Dichotomous variable that took the value of one if the person lived in a household that according to the asset index was in the poorest 40% and 0 otherwise.

a. *Asset index:* The asset index was created using the same methodology in previous years and surveys. Even though the first component explained a small proportion of the variance (14.3%), and some values of the component were small, the signs were the

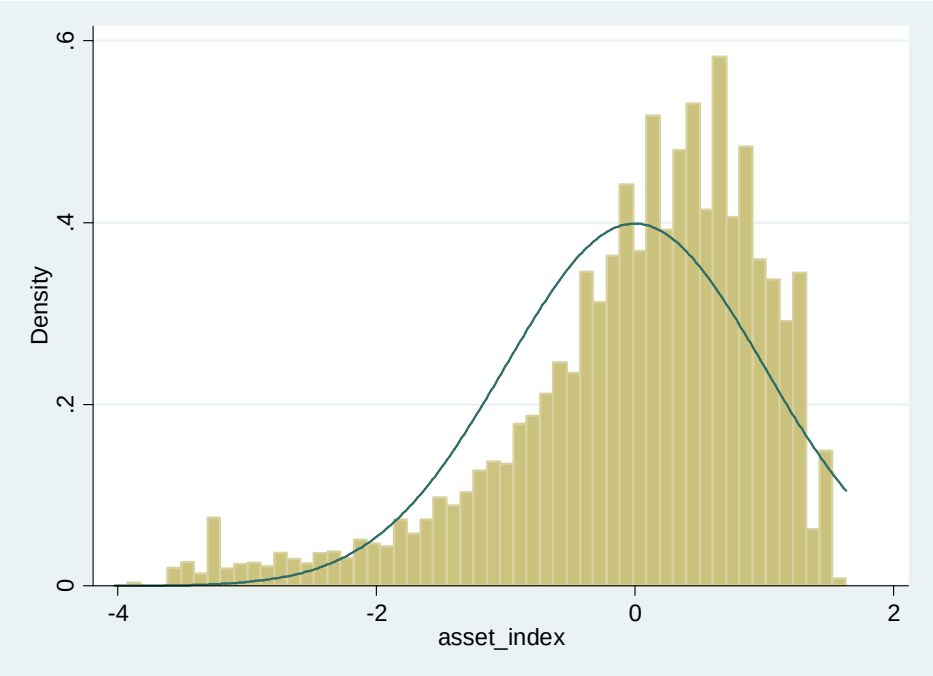
expected in most cases. The index increased with better characteristics of the dwelling and when the household owned any asset. The variables with the highest values were phone, fridge and floor material: tile or linoleum flooring (Table A5.12). Figure A5.5 presents the distribution of the asset index and figure A5.6 the contribution of each variable to the final value of the asset index in rural and urban areas.

TABLE A5. 12. FIRST COMPONENT ASSET INDEX COSTA RICA 2000

Variable	First Component
Material walls: Brick	0.2439
Material walls: Socle with facing	-0.0111
Material walls: Socle without facing	-0.0733
Material walls: Wood with facing	-0.0336
Material walls: Wood without facing	-0.2040
Material walls: Prefabricated	0.0014
Material walls: Other materials	-0.0638
Material walls: Waste material	-0.0881
Material ceiling: Metal or zinc sheet	0.0019
Material ceiling: Fibrocement	0.0370
Material ceiling: Other material	-0.0171
Material ceiling: Waste material	-0.0555
Material floor: Tile, linoleum flooring	0.2607
Material floor: Cement	-0.1194
Material floor: Wood	-0.1343
Material floor: Other	-0.0222
Material floor: Dirt floor	-0.1565
Source water: Public aqueduct	0.2289
Source water: Well	-0.1411
Source of water: River, stream or spring	-0.1667
Source of water: Rain or other source	-0.0479
Sewerage: Public Sewerage	0.1314
Sewerage: Septic tank	0.0683
Sewerage: pit or latrine	-0.2556
Sewerage: Other system	-0.0257
Sewerage: None	-0.0787
Source electricity: Public system	0.0924
Source electricity: No electricity	0.0046
Source electricity: Other source	-0.2258
Energy cooking: Gas	0.1958
Energy cooking: wood or charcoal	-0.2311
Energy cooking: Electricity	-0.0381
Energy cooking: Other sources	-0.0081
Energy cooking: No	-0.0275
TV	0.2538

Phone	0.2701
Fridge	0.2645
Microwave	0.2222
Water heater	0.1011
Washing machine	0.2586
PC	0.17
Car	0.1943

FIGURE A5. 4. DISTRIBUTION ASSET INDEX COSTA RICA 2000



6. *Type of ownership of the dwelling:*

   a. *Own the property:* Dichotomous variable that took the value of 1 if the family owned the house where they were living and 0 if not. It included the options own the house and own the house but is paying a mortgage.

   b. *Rent the property*: Dichotomous variable that took the value of one if the family lived in a rented house or a flat and 0 otherwise.

   c. *Illegal occupation (Squatters) and others*: Dichotomous variable that took the value of 1 if the family lived in a house or apartment as

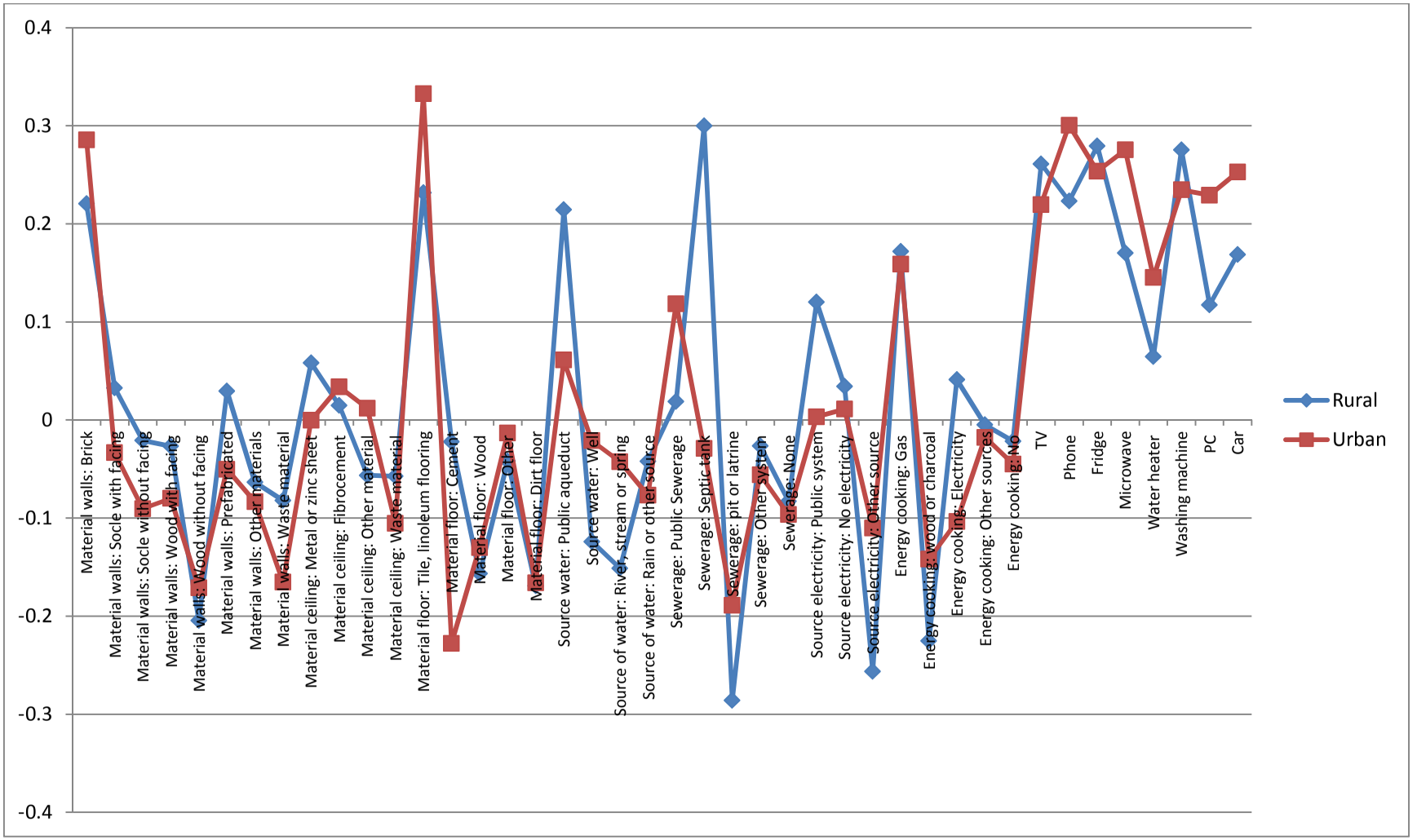
squatters and 0 in other cases. It also included other options of ownership of dwelling (e.g. gift).

7. *No school attendance*: Dichotomous variable that represented the existence of at least one child of school age, who not attending school (Table A5.13).

TABLE A5. 13. NO SCHOOL ATTENDANCE COSTA RICA 2000

	Percentage
School attendance	97.72
No school attendance	2.28

FIGURE A5. 5. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS COSTA RICA 2000



RESULTS

TABLE A5. 14. RESULTS GENERALIZED ORDINAL LOGIT UBN INCLUDING DISABILITY IN THE HOUSEHOLD AND WITHOUT INCLUDING SIZE OF THE HOUSEHOLD (AS INDEPENDENT VARIABLE) COSTA RICA 2000

VARIABLES	(1) Marginal Effects Model NO UBN	(2) Marginal Effects Model ONE UBN	(3) Marginal Effects Model TWO OR MORE UBN
Children household	-0.0361***	0.00911***	0.0270***
	(0.00139)	(0.00127)	(0.000910)
Elderly household	0.0240***	-0.0115***	-0.0125***
	(0.00467)	(0.00224)	(0.00243)
Disability household	-0.0596***	0.0286***	0.0311***
	(0.00379)	(0.00183)	(0.00199)
Working household	-0.00887***	0.00710***	0.00177
	(0.00182)	(0.00167)	(0.00129)
Urban	0.0228***	-0.0190***	-0.00376
	(0.00366)	(0.00348)	(0.00267)
Metropolitan Area Region	0.0205***	-0.00983***	-0.0107***
	(0.00598)	(0.00286)	(0.00312)
Rest Central Region	0.0354***	0.00726*	-0.0427***
	(0.00538)	(0.00415)	(0.00337)
Chorotega Region	0.0111	-0.0153***	0.00421
	(0.00686)	(0.00560)	(0.00407)
Pacific Central Region	0.00152	0.0118*	-0.0133***
	(0.00775)	(0.00683)	(0.00502)
Atlantic Huetar Region	0.0264***	-0.0126***	-0.0138***
	(0.00617)	(0.00296)	(0.00322)
Northern Huetar Region	0.0249***	-0.0119***	-0.0130***
	(0.00728)	(0.00349)	(0.00380)
Female head of the household	-0.0332***	0.0306***	0.00264
	(0.00561)	(0.00455)	(0.00370)
Age head of the household	-0.0105***	0.00504***	0.00549***
	(0.000628)	(0.000303)	(0.000329)

Age square head of the household	0.000102***	-4.88e-05***	-5.31e-05***
	(6.81e-06)	(3.29e-06)	(3.57e-06)
Primary school head of the household	0.149***	-0.0587***	-0.0899***
	(0.00614)	(0.00539)	(0.00323)
Secondary school head of the household	0.289***	-0.109***	-0.180***
	(0.00688)	(0.00645)	(0.00472)
Secondary/ vocational education head of the household	0.334***	-0.160***	-0.174***
	(0.0119)	(0.00586)	(0.00629)
Technical degree head of the household	0.384***	-0.184***	-0.200***
	(0.0162)	(0.00792)	(0.00858)
University or more degree head of the household	0.404***	-0.123***	-0.281***
	(0.00849)	(0.0135)	(0.0130)
Working head of the household	0.0231***	-0.0110***	-0.0120***
	(0.00428)	(0.00205)	(0.00223)
Separate/divorce head of the household	0.00178	-0.000852	-0.000928
	(0.00659)	(0.00316)	(0.00344)
Widowed head of the household	0.0327***	-0.0157***	-0.0170***
	(0.00802)	(0.00384)	(0.00418)
Single head of the household	0.0128**	-0.0168***	0.00402
	(0.00645)	(0.00586)	(0.00444)
Poorest 40%	-0.251***	0.0538***	0.198***
	(0.00305)	(0.00360)	(0.00338)
Own dwelling	0.0840***	-0.0316***	-0.0523***
	(0.00461)	(0.00426)	(0.00280)
Rent dwelling	0.0867***	-0.0247***	-0.0620***
	(0.00569)	(0.00558)	(0.00410)
Observations	378,233	378,233	378,233

Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE A5. 15. RESULTS GENERALIZED ORDINAL LOGIT UBN INCLUDING HEAD OF THE HOUSEHOLD WITH DISABILITY AND WITHOUT INCLUDING SIZE OF THE HOUSEHOLD (AS INDEPENDENT VARIABLE) COSTA RICA 2000

VARIABLES	(1) Marginal Effects Model NO UBN	(2) Marginal Effects Model ONE UBN	(3) Marginal Effects Model TWO OR MORE UBN
Children household	-0.0368***	0.00945***	0.0273***
	(0.00139)	(0.00128)	(0.000913)
Elderly household	0.0166***	-0.00797***	-0.00867***
	(0.00468)	(0.00224)	(0.00244)
Working household	-0.00959***	0.00742***	0.00217*
	(0.00183)	(0.00168)	(0.00129)
Urban	0.0231***	-0.0192***	-0.00391
	(0.00366)	(0.00348)	(0.00267)
Metropolitan Area Region	0.0204***	-0.00975***	-0.0106***
	(0.00599)	(0.00287)	(0.00312)
Rest Central Region	0.0350***	0.00730*	-0.0423***
	(0.00539)	(0.00415)	(0.00337)
Chorotega Region	0.00972	-0.0146***	0.00488
	(0.00687)	(0.00561)	(0.00408)
Pacific Central Region	0.000909	0.0120*	-0.0129**
	(0.00777)	(0.00684)	(0.00503)
Atlantic Huetar Region	0.0247***	-0.0118***	-0.0129***
	(0.00618)	(0.00296)	(0.00322)
Northern Huetar Region	0.0250***	-0.0120***	-0.0130***
	(0.00730)	(0.00350)	(0.00381)
Head of the household with disability	-0.0281***	0.0134***	0.0146***
	(0.00525)	(0.00252)	(0.00274)
Female head of the household	-0.0339***	0.0306***	0.00326
	(0.00562)	(0.00455)	(0.00371)
Age head of the household	-0.0113***	0.00542***	0.00590***
	(0.000631)	(0.000305)	(0.000331)
Age square head of the household	0.000108***	-5.19e-05***	-5.65e-05***
	(6.87e-06)	(3.32e-06)	(3.60e-06)
Primary school head of the household	0.150***	-0.0595***	-0.0902***

	(0.00615)	(0.00540)	(0.00324)
Secondary school head of the household	0.291***	-0.110***	-0.181***
	(0.00690)	(0.00646)	(0.00473)
Secondary/ vocational education head of the household	0.337***	-0.161***	-0.176***
	(0.0119)	(0.00588)	(0.00631)
Technical degree head of the household	0.389***	-0.186***	-0.203***
	(0.0164)	(0.00797)	(0.00864)
University or more degree head of the household	0.408***	-0.125***	-0.283***
	(0.00851)	(0.0135)	(0.0131)
Working head of the household	0.0257***	-0.0123***	-0.0134***
	(0.00429)	(0.00205)	(0.00224)
Separate/divorce head of the household	0.00279	-0.00134	-0.00146
	(0.00660)	(0.00316)	(0.00344)
Widowed head of the household	0.0329***	-0.0158***	-0.0172***
	(0.00803)	(0.00384)	(0.00419)
Single head of the household	0.0122*	-0.0164***	0.00417
	(0.00647)	(0.00587)	(0.00446)
Poorest 40%	-0.254***	0.0548***	0.199***
	(0.00305)	(0.00360)	(0.00339)
Own dwelling	0.0842***	-0.0319***	-0.0523***
	(0.00462)	(0.00426)	(0.00281)
Rent dwelling	0.0877***	-0.0251***	-0.0625***
	(0.00570)	(0.00559)	(0.00411)
Observations	378,233	378,233	378,233

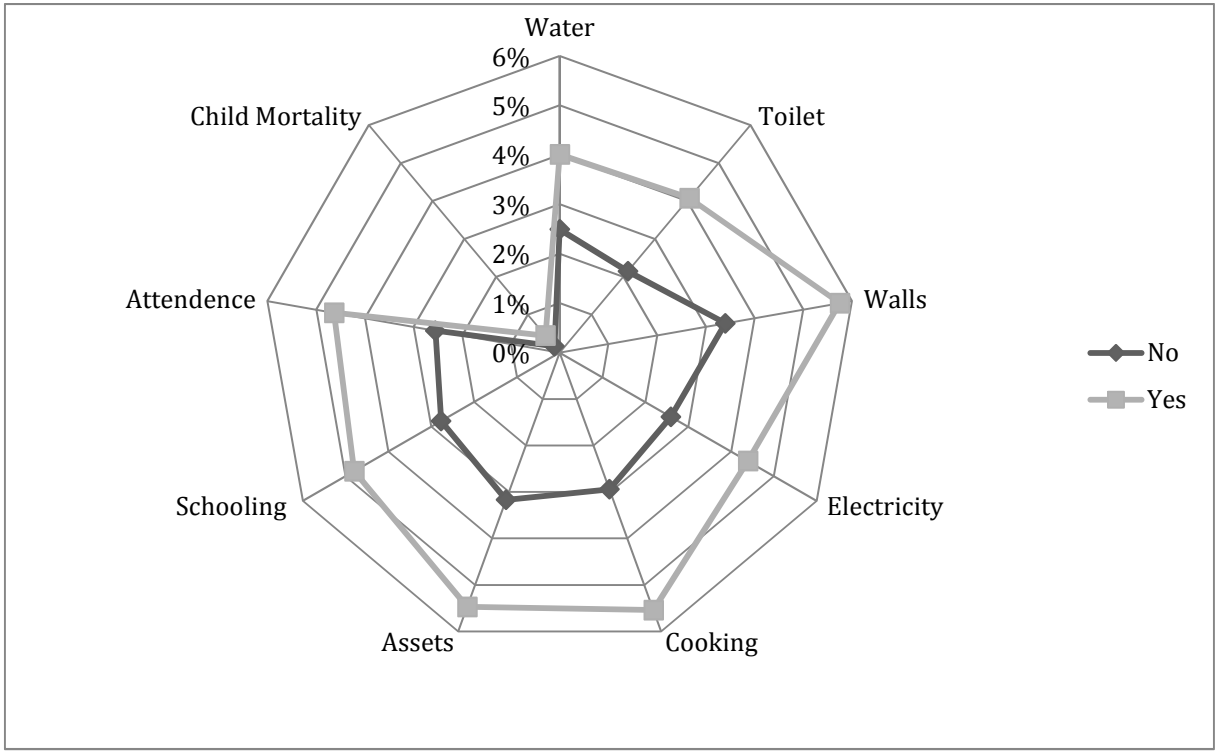
Robust Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

MULTIDIMENSIONAL POVERTY ANALYSIS

TABLE A5. 16. DIMENSIONS, INDICATORS AND WEIGHTS MULTIDIMENSIONAL POVERTY ANALYSIS COSTA RICA

Dimension	Indicator	Definition		Weight
Health	Child mortality	Any child has died in the family	Is the result of the question related to ever child alive and current child alive	1/3
Education	Years schooling	Number of household members older than 12 that have at least than six years of schooling (primary school)		1/6
	Child school attendance	Any school child who is not attending school	Older than 6 younger or equal to 15	1/6
Living Standard	Electricity	If the dwelling has no electricity		1/18
	Water	The household does not have access to safe drinking water such as aqueduct, public faucet, water truck, or delivery service	Deprive if : the household has access to water by well with or without pump, rain water, river, creek, spring or bottled or bagged water	1/18
	Sanitation	The household sanitation is not improved or in shared with other households	Deprived if: Toilet not connected to a sewage drain or latrine; toilet connected to a septic tank, no sewerage. Also, if the sanitation services are shared with other households	1/18
	Walls material	Deprived if the household has prefabricated, clay brick, zinc walls or no walls.		1/18
	Cooking fuel	The household does not have a place to cook, or cooks with wood or mineral coal	Deprived if firewood, wood, discarded material, mineral coal, others. No deprived if electrical, natural gas, gas in cylinder petroleum	1/18
	Asset ownership	The household does not own more than one assets of the following list: TV, phone, fridge, microwave, washing machine PC or car	It is always not deprive if the household has a car	1/18

FIGURE A5. 6. CENSORED HEADCOUNT HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS MULTIDIMENSIONAL POVERTY ANALYSIS COSTA RICA



APPENDIX 6

MEXICO

SOCIAL PROTECTION SYSTEM

SOCIAL INSURANCE

The social security system in Mexico started during the government of Manuel Avila Camacho (1942-1946). In 1943 the Ministry of Health was created and legislation that established the *Mexican Social Security Institute* (IMSS) was enacted. The IMSS was the national entity that provided services to private-sector workers and their families (Haggard and Kaufman, 2008, Martínez, 2006). The Institute of Social Services and Security for Civil Servants (ISSSTE) was created in 1959. This institution covered public employees and their families (Knaul and Frenk, 2005).

As a result of the existence of two institutions that deliver health care, the system was stratified and limited to working population and their families. Poor and vulnerable populations including unemployed, self-employed and informal workers were excluded. Additionally, when services were provided to these groups, they were given by the Ministry of Health. Nevertheless, the services covered were not defined, an aspect that created problems in access and supply of health care (Knaul and Frenk, 2005).

During the 1950s and 60s, the labour movement was controlled by the ruling party. This limited the expansion of the social security system, with coverage of around 12% of the workforce. The coverage of social security increased to 35%

during the next decade (Haggard and Kaufman, 2008), with demographic changes and industrialization as the main determinants of this increase. Contrary to expectations, democracy did not play an important role, therefore the system was stratified and deprived and poor regions were excluded. On the other hand, urban areas and high productivity industries accessed social security services usually provided by the IMSS (Fernando Filgueira, 2005).

In 1973, a partial reform of the system aimed to increase coverage in rural areas and informal workers, which were around 40% of the workforce (Kritzer, 2000, Martínez, 2006). The coverage for primary health care in rural areas increased rapidly, and by the end of the 1980s, around 54% of the population were covered (Mesa-Lago, 1997). Despite the attempts to increase coverage in poor regions, at the end of the 1970s, still, half of the population excluded from the system were living in the poorest areas of the country (Haggard and Kaufman, 2008).

Different problems created financial difficulties that made the system inefficient. Indeed, aspects related to high levels of evasion; increases in the percentage of the population working in the informal sector; stratification of the system and the existence of two programmes one for workers in the private and other for those working in the public sector were the main causes of this inefficiency (Kritzer, 2000, Levy, 2006).

The economic crisis during the 1980s negatively affected the inflation rate and created a fiscal deficit, with a direct impact on the levels of social expenditure. Liberal governments took the power after the crisis and liberal reforms were

implemented in the pension system, with the main objective of reducing the fiscal deficit (Haggard and Kaufman, 2008). Other factors that affected the system were related to demographic transition, financial unsustainability of the IMSS and small proportion of national savings that existed at the beginning of the 1990s (Levy, 2006, Martínez, 2006).

Only after the crisis in 1994, the national government decided to reform the pension system. The most important change was move from a public PAYGO system to a defined-contribution pre-funded scheme with mandatory individual accounts administrated by fund management companies (AFORE). Their main functions were to manage individual accounts; to receive contributions; to deposit those in the individual accounts and to provide services to invest in the individual accounts. The total contribution is 6.5%, with a contribution of 1.12% by the employee, 5.15% by the employer and 0.225% by the State (Mesa-Lago, 1997). New workers were forced to select the private individual account scheme and receive the benefits offered by this system. On the other hand, old workers had the opportunity to choose between staying in the old system regulated with the 1973 law or to contribute to the private system regulated with the 1995 law (Levy, 2006). The requirements to obtain a pension are being older than 65 years and having contributed to the system for at least 25 years. After this, the person would receive a basic contribution, plus an interest minus an administration fee charged by the AFORE.

Disability and survival insurance are manage by the IMSS with a contribution of 4% (Mesa-Lago, 2008b). The disability pension would be paid to a pensioner with

at least 50% to 74% of earning capacity loss and that contributed during at least 250 weeks. The amount of money payable to the individuals is around 35% of the average income earned in the last 500 weeks (Grushka and Demarco, 2003, Kritzer, 2000).

A mandatory contribution is made by public and private workers. However, self-employed and informal workers voluntarily contribute to the system. This has a negative effect in the extension of coverage. Furthermore, non-wage costs reduce the demand of formal employees, and increase the percentage of population who do not contribute to the social security system (Levy, 2006, Martínez, 2006).

No structural reforms were implemented to the health care system during the 1990s. Before 2003, the IMSS provide services to workers in the private sector, pensioners and their families (40% of the population). Public workers and their families had access to health care services by the ISSTE (7%). Additionally, middle and high income workers were enrolled with private health insurance companies (2-3%). The Minister of Health provided some services to poor populations (Frenk et al., 2007, Knaul and Frenk, 2005, Mesa-Lago, 2004).

In 2003, a reform to the health care system was implemented. The main feature of the reform was the creation of a new component of the system called *System for Social Protection in Health* (*Seguro Popular*), which is not associated with the labour sector and provides care to poor populations. The main goal was to reach universal coverage by 2010. Furthermore, objectives related to the reduction of out of pocket (OOP) and catastrophic payments and to assure a more equitable

resource distribution in the system (Frenk et al., 2007, Knaul and Frenk, 2005, Levy, 2006).

The funding of *Seguro Popular* is co-responsibility of federal and state governments. The distribution of resources depends on the levels of development among states. States with low levels of development get a higher contribution from national government. In addition, individuals contribute according to their levels of income, with a maximum family contribution of 5% of disposable income (Frenk et al., 2007, Knaul and Frenk, 2005).

The reform has had a positive effect on the increase in coverage of poor populations. Social security expenditures increased from 6.2% in 2002 to 6.5% in 2006. A reduction in OOP and catastrophic expenditures was also observed, with an effect on equity and solidarity of the system (Frenk et al., 2007).

SOCIAL ASSISTANCE

Social assistance programmes were established in the 1990s, and were orientated to target the poorest. The first programme was called *Programa Nacional de Solidaridad* (PRONASOL), this programme collapsed in 1994. The next and more stable programme was *Education, Health and Food Programme* (PROGRESA), whose main components were to focus to improve levels of education, health and nutrition. This programme was renamed *Oportunidades* at the beginning of 2000, whose main objective is to reduce trans-generational poverty. This programme is a CCT programme that benefits poor families, with conditions linked to school

attendance and periodical medical consultations (Barrientos et al., 2008, Haggard and Kaufman, 2008).

In 2008, the strategy *Vivir Mejor* was launched. This strategy has five major goals related to the development of basic capabilities; to protect individuals from risks; to promote equal regional development; to increase productivity and to include criteria related to sustainability in social policy (Lomelí et al., 2012). The strategy proposes three major lines of work: 1. development of basic capacities; 2. strengthening social protection networks and 3. improve links between social policies and sustained economic development (Lomelí et al., 2012).

The programme *Oportunidades* aims to increase the level of basic capabilities of poor individuals. Currently the programme includes a food subsidy, an energy subsidy; a pension for members older than 70 years and a youth programme. In the second line of work, strategies aiming to assist vulnerable populations have been implemented, with pensions for people older than 70 years as one important example. In the last line of work, different policies and programmes related to labour market insertion have been developed (Lomelí et al., 2012).

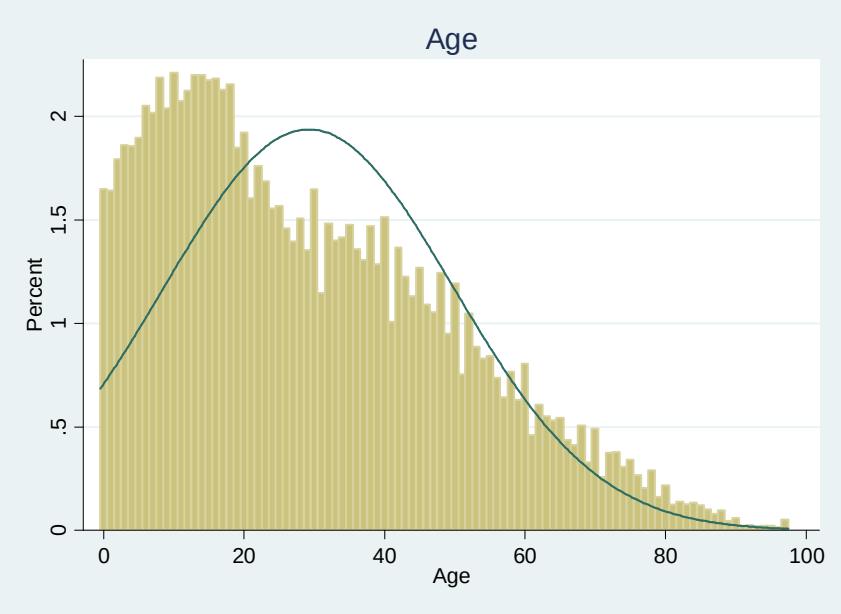
MEXICO ENIGH 2008

DESCRIPTIVE STATISTICS

According to the information of the ENIGH in 2008, overall 51.5% of the sample was female; with an average age of 29 years old and the highest values included in

this variable was 97, however individuals older than this age were included in this group (Figure A6.1).

FIGURE A6. 1. HISTOGRAM AGE MEXICO ENIGH 2008



The average size of the households was 5 individuals, with a maximum size of 43 members (multi-family). According to the Marginalization Index[37] calculated by INEGI, 4.5% of the population lived in households with an extremely high level of marginalization (Table A6.1).

TABLE A6. 1. MARGINALIZATION INDEX MEXICO ENIGH 2008

Marginalization index	Percentage
High	12.6
Low	14.9
Medium	11.9
Extremely high	4.5
Extremely low	56.1

[37] The Index of Marginalization considers four dimensions: Education, dwelling characteristics; income and living in localities with less than 5,000 inhabitants Consejo Nacional de Poblacion (CONAPO) (2013) **Índice absoluto de marginación 2000-2010**. México D. F: Consejo Nacional de Población (CONAPO).

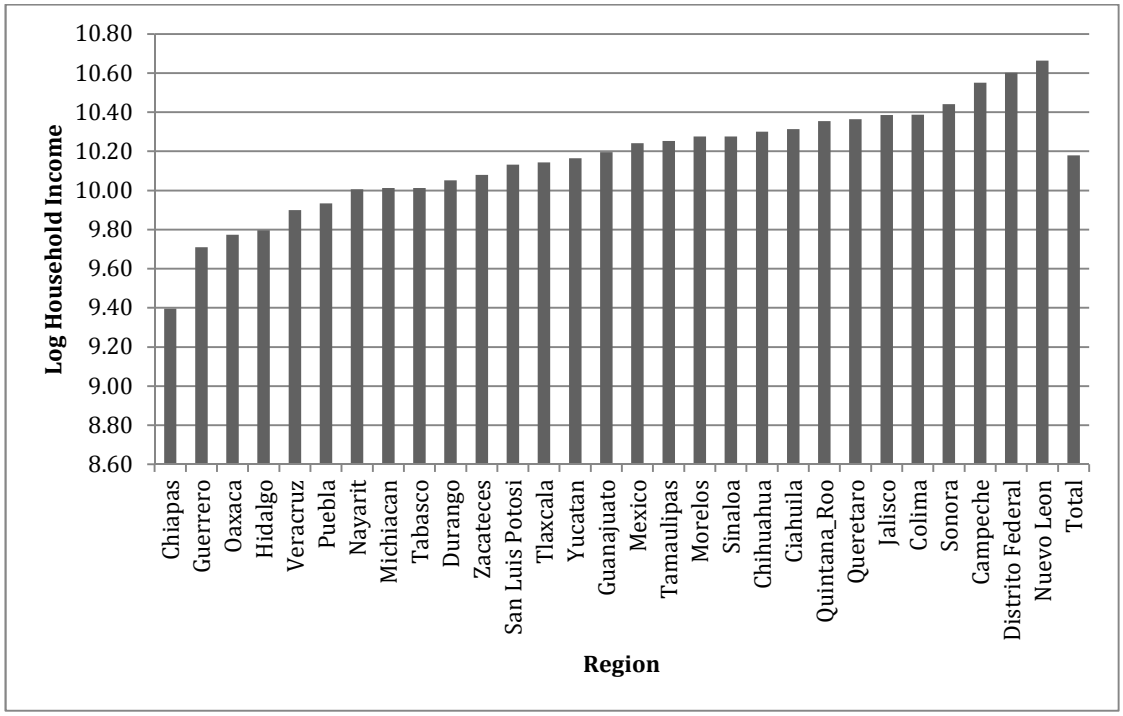
In aspects related to education, 12% of the population was illiterate and 49% of the population had an education level equal or lower than primary school, with less than 1% with a master or doctoral levels (Table A6.2).

TABLE A6. 2. LEVEL OF EDUCATION MEXICO ENIGH 2008

Educational level	Percentage
None	8.7
Preschool	5.35
Primary school	37.25
Secondary school	23
High School	11.4
Technical	3.9
Normal	0.82
Professional	8.9
Master or PhD	0.73

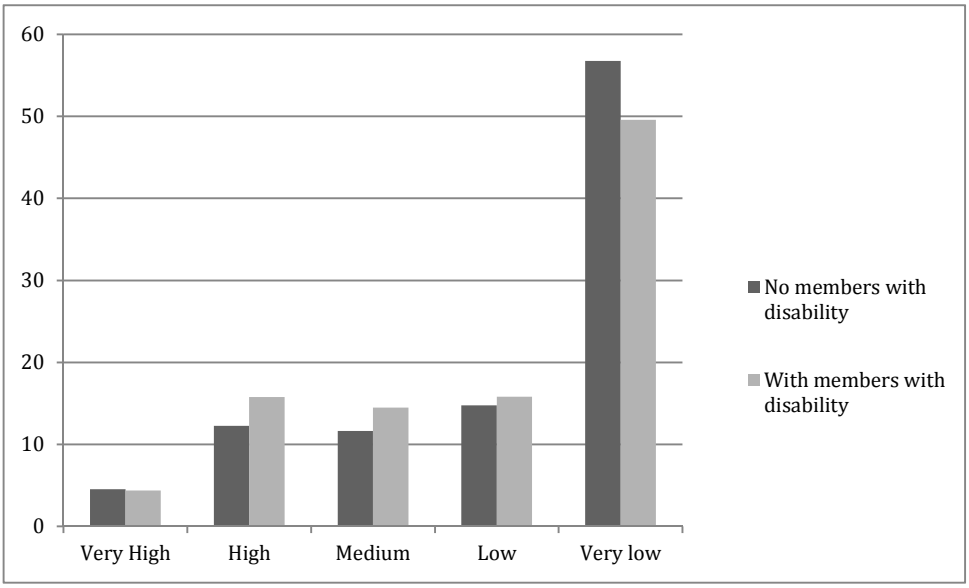
Chiapas and Guerrero were the regions with the lowest level of household income in Mexico. By contrast, Nuevo Leon had the highest level, surpassing el Distrito Federal and Campeche (Figure A6.2).

FIGURE A6. 2. MEAN LOGARITHM HOUSEHOLD INCOME PER REGION MEXICO ENIGH 2008



Only one question on disability was asked in this year and it was asked at the household level. Therefore, it was not possible to define the characteristics of individuals with a disability. In general, 9.4% of the households referred to have at least one member with disabilities, with 90.6% of those households with only one member with disability and 8% with two members. The maximum number of members with disability in a household was 20. According to the marginalization index, the percentage of households with disabled members with very low levels in this index is lower than for households without disabled members (Figure A6. 3).

FIGURE A6. 3.MARGINALIZATION INDEX AND HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS MEXICO ENIGH 2008



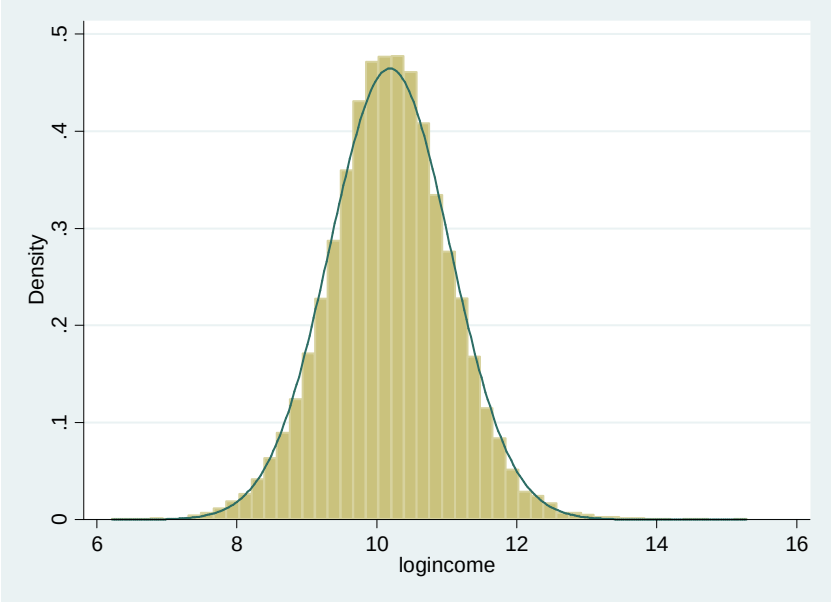
The percentage of households with disabled members and food insecurity is higher than for households without disabled members. Indeed, 19.4% of the households with disabled members had food insecurity compared to 12% for other households.

VARIABLES INCLUDED IN THE MODEL

DEPENDENT VARIABLES MEXICO

Logarithm of household income: Logarithmic transformation of the household income, which was the total sum of all the sources of income that a household had, including labour income, rents, pensions and benefits from social assistance programmes (Figure A6.4).

FIGURE A6. 4. HISTOGRAM OF LOGARITHM HOUSEHOLD INCOME MEXICO ENIGH 2008



INDEPENDENT VARIABLES

1. *Household characteristics*:
    a. *Disability household*: Dichotomous variable with value equal than one if at least one member of the household was living with any type of impairment. The question was asked at the household level and it was:

In this household is there a person with disability? (limitation to move, walk, use their arms or legs, a blind person, deaf or mute, mentally retarded or with a mental impairment) Yes No

Overall, 9.5% of the population live in households with a member with a disability (Table A6.3).

TABLE A6. 3. DISABILITY IN THE HOUSEHOLD MEXICO ENIGH 2008

	Percentage
No disabled members	90.5
Disabled members	9.5

b. *Number of individuals older than 65 years in the household*:

Continuous variable that took values between 0 and 2 (Table A6.4).

TABLE A6. 4. ELDERLY HOUSEHOLD MEXICO ENIGH 2008

Older 65 years	**Percentage**
0	81.43
1	12.77
2 or more	5.8

c. Number of children in the household: Continuous variable with values between 0 and 5. It represented the number of individuals younger than 12 years old per household (Table A5.5).

TABLE A6. 5. CHILDREN IN THE HOUSEHOLD MEXICO ENIGH 2008

Children household	**Percentage**
0	35.1
1	25.4
2	22.6
3	10.9
4	4.4
5 or more	2.0

d. Number of working individuals per household: Continuous variable with values between 0 to 5 individuals. In addition, the person should be older than 12 years old and should work and receive a salary (Table A6.6).

TABLE A6. 6. WORKING INDIVIDUALS PER HOUSEHOLD MEXICO ENIGH 2008

Working individuals per household	Percentage
0	4.9
1	34.7
2	33.1
3	15.7
4	7.6
5 or more	3.96

e. *Size of household:* Continuous variable with values between 1 and 43. The average size of household was 5 individuals.

2. *Area:* Dichotomous variable, which took the value of one when the person lived in an urban area.

3. *Region:* Dichotomous variables that represented each region in Mexico. Each variable took the value of one when the person lived in the region and 0 in the other case. San Louis of Potosi was the reference variable.

4. *Household head characteristics*

a. *Age head of the household:* continuous variable with values between 15 and 97+; with an average age equal to 47.5 years old.

b. *Age squared head of the household:* Continuous variable with values between 225 and 9409.

c. *Sex of the head of the household:* Dichotomous variable with value equal to one if the head of the household was female. 78.9% of the population lived in a household with a male head.

d. *Level of education of the head of the household:* Dichotomous variable that took the value of one if the person was living in a household, whose head had that level of education. The average level of education of the head of household was complete primary school. Only 1.35% of the population lived in households where the head

had a graduated degree. The variable associated to no education (including pre-school) and it was the reference variable (Table A6.7).

TABLE A6. 7. LEVEL OF EDUCATION HEAD OF THE HOUSEHOLD MEXICO ENIGH 2008

Education head household	Percentage
No education	10
Incomplete primary school	22.7
Complete primary school	19.5
Incomplete secondary school	4.0
Complete secondary school	21.1
Incomplete high school	3.2
Complete high school	7.5
Incomplete undergraduate	2.1
Complete undergraduate	8.4
Graduate degree	1.4

e. Working head of the household: Dichotomous variable with value equal to 0 if the person lived in a household, whose head was not working and earning a salary (Table A6.8).

TABLE A6. 8. WORKING HEAD OF THE HOUSEHOLD MEXICO ENIGH 2008

Working head	Percentage
No	21.4
Yes	78.6

f. *Head of the household marital status:* Dichotomous variables that represented the marital status of the head of household. Each variable took the value of 1 if the person was living in a household, whose head was single or married, or widower or divorce. Single head of household was the reference variable.

5. Poorest 40% according to the asset index: Dichotomous variable with value equal to one if the person lived in a household in the poorest 40% according to the asset index.

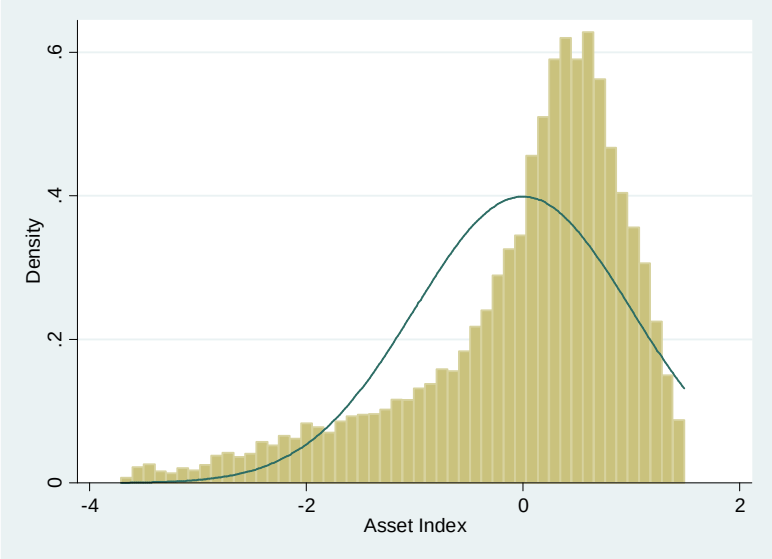
a. *Asset index:* The first component explained the variance of the variables by 17.8%. The results of the first component are presented in table A6.9. Although, the first component did not explain a high percentage of the variance, elements included had the expected effect. Indeed, the index increased when the household had better characteristics and owned an asset. The distribution of the index is presented in figure A6.5 and figure A6.6 the contribution of each variable to the values of the asset index in rural and urban areas.

TABLE A6. 9. FIRST COMPONENT ASSET INDEX MEXICO ENIGH 2008

Variable	First Component
Wall material: Rubbish	-0.0066
Wall material: Carton	-0.0269
Walls material: Metal lamina	-0.0306
Walls material: Bamboo	-0.0497
Walls material: Bajareque	-0.0631
Walls material: Wood	-0.1078
Walls material: Adobe	-0.0967
Walls material: Bricks	0.1762
Floor materials: Earth	-0.1577
Floor materials: Cement	-0.0965
Floor materials: Lamina	0.0277
Floor materials: Marble	0.1747
Public aqueduct	0.2279
Public outside the house	-0.1393
Other source water	-0.0452
Source water: Well	-0.1006
River or other sources of water	-0.1172
Public sewerage	0.2071
Septic fossa	-0.075
River and others	-0.0389
No sewerage	-0.1993
Public electricity source	0.1406
Other source of electricity	-0.0814
No electricity	-0.1159
Gas	0.206
Natural gas	0.0533
Firewood	-0.2532
Electricity	-0.0034
Other cooking source	-0.0179
Public trash collection	0.2398
Burning trash	-0.2273
Bury trash	-0.0407
Other sources of elimination trash	-0.0496

Radio	0.016
Fridge	0.2127
Stove	0.2333
Washing machine	0.1765
Iron	0.194
Ventilator	0.1093
Vacuum	0.1063
PC	0.1655
Printer	0.1452
Nintendo	0.1147
Radio and recorder	0.0484
Stereo	0.1296
TV	0.1754
DVD	0.1606
VCR	0.1032
Blender	0.1865
Toaster	0.1258
Microwave	0.1846

FIGURE A6. 5. HISTOGRAM ASSET INDEX MEXICO ENIGH 2008



6. *Type of ownership of the dwelling:*

   a. Own the property: It included the options of own the house and own the house but is paying a mortgage.

   b. Rent the property: Dichotomous variable that took the value of one when the person was living in a dwelling and paying rent and 0 in other cases.

c. Borrow the property and other: Dichotomous variable that took the value of one if the person was living in a dwelling and was not paying rent and did not own it.

7. *No school attendance:* Dichotomous variables with value equal to one when the person lived in a household with school age children not attending school (Table A6.10).

TABLE A6. 10. NO SCHOOL ATTENDANCE MEXICO ENIGH 2008

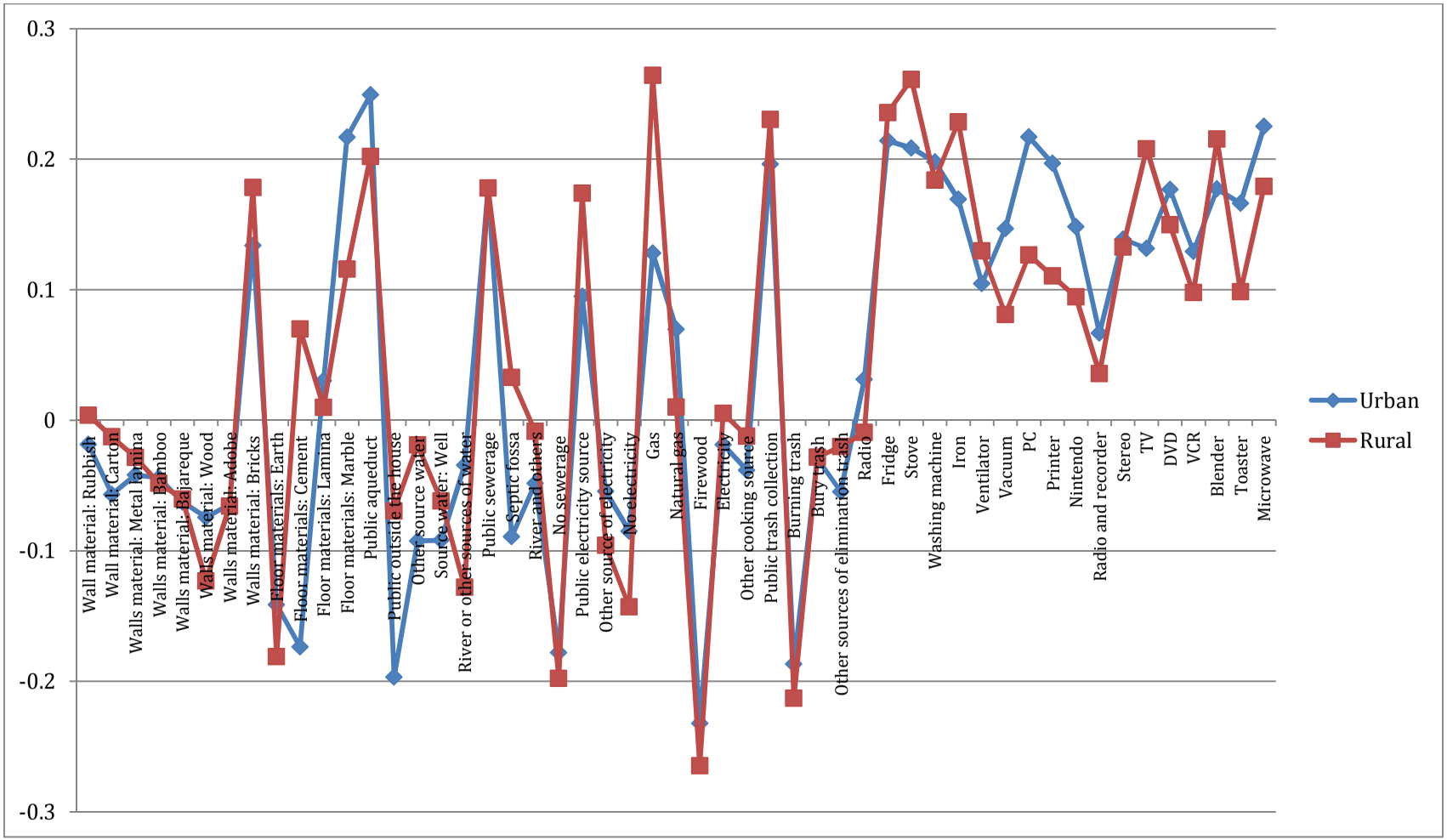
No School attendance	Percentage
Attend	84.9
No attend	15.1

8. *Food insecurity:* Dichotomous variable that took the value of one when at least one adult of the household was hungry but did not eat for money monetary reasons. This is considered to be moderate food insecurity according to the Food and Agriculture Organization of the United Nations (FAO) (Table A6.11).

TABLE A6. 11. FOOD INSECURITY MEXICO ENIGH 2008

Food insecurity	Percentage
No	84.53
Yes	15.47

FIGURE A6. 6. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS MEXICO ENIGH 2008



CROSS-SECTIONAL ANALYSIS

RESULTS 2008

Regressions

Dependent variable: Natural logarithm household income

TABLE A6. 12. RESULT MODEL 1 MEXICO ENIGH 2008 (REGRESSION OLS: NATURAL LOGARITHM HOUSEHOLD INCOME)

Variable	model1	model2	model3	model4	model5	model6	model7	model8	model9
Number elderly household	-0.05***	-0.03***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.07***	-0.07***
Number children household	-0.15***	-0.12***	-0.07***	-0.07***	-0.06***	-0.06***	-0.06***	-0.14***	-0.13***
Disability in the household	-0.09***	-0.09***	-0.04***	-0.04***	-0.03***	-0.02***	-0.02***	-0.06***	-0.06***
Number working household	0.21***	0.19***	0.21***	0.21***	0.20***	0.20***	0.20***		
Size household	0.04***	0.05***	0.06***	0.05***	0.05***	0.06***	0.06***	0.13***	0.13***
Urban		0.63***	0.40***	0.42***	0.25***	0.26***	0.26***	0.28***	0.28***
Aguas Calientes		0.19***	0.18***	0.18***	0.07***	0.09***	0.09***	0.11***	0.11***
Baja California		0.23***	0.33***	0.33***	0.30***	0.29***	0.30***	0.31***	0.31***
Baja California South		0.54***	0.50***	0.51***	0.47***	0.47***	0.47***	0.49***	0.49***
Campeche		-0.01	-0.02	-0.01	-0.09***	-0.08***	-0.08***	-0.16***	-0.16***
Ciahuila		0.14***	0.09***	0.09***	0.04**	0.04**	0.04**	0.01	0.01
Colima		0.26***	0.21***	0.22***	0.16***	0.15***	0.15***	0.18***	0.18***
Chiapas		-0.56***	-0.46***	-0.47***	-0.41***	-0.42***	-0.41***	-0.45***	-0.45***
Chihuahua		0.04**	0.06***	0.06***	0.03*	0.04**	0.05***	0.02	0.02
Distrito Federal		0.30***	0.18***	0.20***	0.14***	0.14***	0.14***	0.14***	0.14***
Durango		-0.07***	-0.07***	-0.08***	-0.08***	-0.08***	-0.07***	-0.09***	-0.08***
Guanajuato		0.03*	0.09***	0.10***	0.02	0.03**	0.03**	0.03**	0.03**
Guerrero		-0.40***	-0.35***	-0.36***	-0.28***	-0.27***	-0.28***	-0.25***	-0.25***
Hidalgo		-0.14***	-0.15***	-0.15***	-0.12***	-0.12***	-0.12***	-0.12***	-0.12***

Jalisco		0.13***	0.12***	0.14***	0.06***	0.06***	0.07***	0.07***	0.07***
Mexico		-0.01	0	0	0.01	0.01	0.01	0.01	0.01
Michiacan		-0.01	0.02	0.02	0	0.01	0.01	-0.02	-0.02
Morelos		0.03	0.02	0.02	0.05***	0.05***	0.05***	0.07***	0.07***
Nayarit		-0.09***	-0.11***	-0.11***	-0.10***	-0.10***	-0.10***	-0.08***	-0.08***
Nuevo Leon		0.31***	0.25***	0.25***	0.21***	0.21***	0.21***	0.22***	0.22***
Oaxaca		-0.27***	-0.24***	-0.25***	-0.18***	-0.17***	-0.17***	-0.16***	-0.15***
Puebla		-0.27***	-0.22***	-0.21***	-0.18***	-0.19***	-0.18***	-0.16***	-0.16***
Queretaro		0.20***	0.17***	0.17***	0.12***	0.12***	0.12***	0.12***	0.12***
Quintana Roo		0.01	0.05**	0.05**	0.08***	0.08***	0.07***	0.11***	0.11***
Sinaloa		0.18***	0.14***	0.14***	0.09***	0.09***	0.09***	0.09***	0.09***
Sonora		0.27***	0.20***	0.19***	0.15***	0.16***	0.16***	0.15***	0.16***
Tabasco		0.02	-0.02	-0.03	-0.01	0.01	0.01	0	-0.01
Tamaulipas		0.07***	0.04**	0.05**	0.03*	0.03	0.03	0.01	0.01
Tlaxcala		-0.15***	-0.12***	-0.13***	-0.08***	-0.09***	-0.09***	-0.02	-0.01
Veracruz		-0.03	-0.05***	-0.04**	-0.03*	-0.03*	-0.03*	-0.03*	-0.03*
Yucatan		-0.03**	-0.01	-0.02*	0.01	0	0	0.02	0.02
Zacatecas		-0.06***	-0.05**	-0.05**	-0.07***	-0.08***	-0.08***	-0.07***	-0.07***
Age head			0.01***	0.01***	0.00**	0.00***	0.00***	0.01***	0.01***
Age head square			-0.00**	0	0.00***	0.00***	0.00***	0.00*	0.00*
Head female			0.05***	0.05***	0.02***	0.03***	0.03***	0.04***	0.04***
Divorce head			0.02**	0.02*	0	0	0	-0.02**	-0.02**
Widower head			0.06***	0.05***	0.02*	0.02	0.02*	0.01	0.01
Married head			0.09***	0.08***	0.04***	0.04***	0.04***	0.02**	0.02**
Incomplete primary school head			0.19***	0.19***	0.13***	0.13***	0.12***	0.12***	0.12***
Complete primary school head			0.37***	0.36***	0.26***	0.24***	0.24***	0.23***	0.23***
Incomplete secondary school head			0.48***	0.48***	0.34***	0.33***	0.32***	0.32***	0.31***
Complete secondary school head			0.59***	0.58***	0.41***	0.39***	0.39***	0.36***	0.36***
Incomplete high school head			0.69***	0.69***	0.49***	0.47***	0.46***	0.44***	0.44***
Complete high school head			0.84***	0.83***	0.61***	0.59***	0.58***	0.56***	0.55***
Incomplete undergraduate head			1.06***	1.06***	0.83***	0.80***	0.79***	0.75***	0.75***
Complete undergraduate head			1.42***	1.41***	1.17***	1.14***	1.13***	1.08***	1.08***
Post graduate studies head			1.78***	1.77***	1.52***	1.50***	1.49***	1.44***	1.44***

Working head household								0.12***	0.12***
Rent house				-0.06***	-0.09***	-0.09***	-0.09***	-0.08***	-0.08***
Own house				0.10***	0.07***	0.07***	0.06***	0.07***	0.07***
Poorest 40					-0.44***	-0.41***	-0.41***	-0.43***	-0.43***
Food insecurity						-0.20***	-0.19***	-0.20***	-0.20***
No school attendance							-0.05***		-0.05***
Constant	9.81***	9.22***	8.20***	8.26***	9.01***	9.02***	9.03***	9.02***	9.02***
Ll	-1.39E+05	-1.25E+05	-1.08E+05	-1.07E+05	-1.03E+05	-1.02E+05	-1.02E+05	-1.07E+05	-1.07E+05
R2	0.14	0.32	0.5	0.5	0.54	0.54	0.55	0.5	0.51
AIC	278042.96	250338.86	215229.66	214372.49	205407.8	203975	203866.58	213749.73	213666.91
BIC	278100.97	250706.25	215742.07	214904.24	205949.22	204526.08	204427.33	214300.81	214227.66

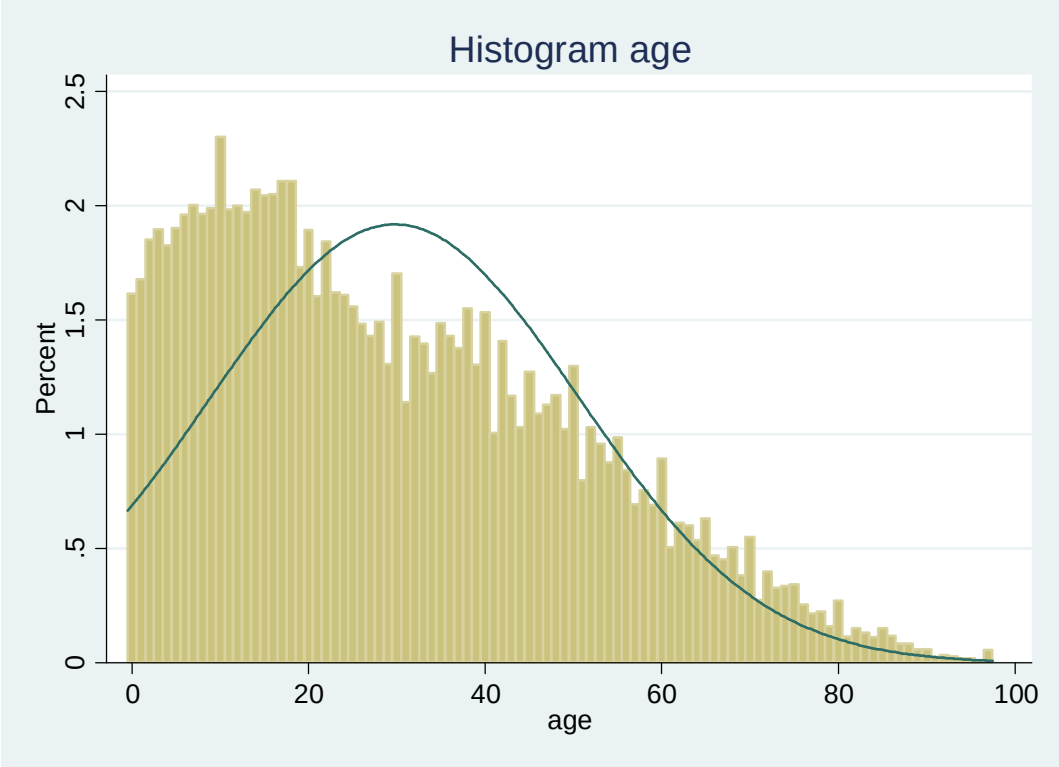
***p-value>0.01; **>0.05; *>0.1

MEXICO ENIGH 2010

DESCRIPTIVE STATISTICS

Overall, 51.2% of the sample was female. The average age was 29.7 years, with a maximum of 97 years (including older than 97) (Figure A6.7). 76.7% of the population lived in urban areas, with the State of Mexico as the most populated region (13.5%).

FIGURE A6. 7. HISTOGRAM AGE MEXICO ENIGH 2010



12.6% of the population in Mexico was illiterate, with 7.9% of the population without education, 35.6% primary school and less than 1% of individuals with a graduate degree (Table A6.13).

TABLE A6. 13. EDUCATION LEVEL MEXICO ENIGH 2010

	Percentage
No education	7.9
Preschool	5.54
Primary school	35.6
Secondary school	23.44
High School	12.2
Normal	0.62
Technical education	3.73
Professional education	10.02
Master	0.73
PhD	0.15

59.8% of the population was classified as having a very low level of marginalization and 3.4% as very high. 51.7% of individuals older than 12 years old referred to be working the week previous the interview. 69.5% of the population had access to health care using the *Seguro Popular*.

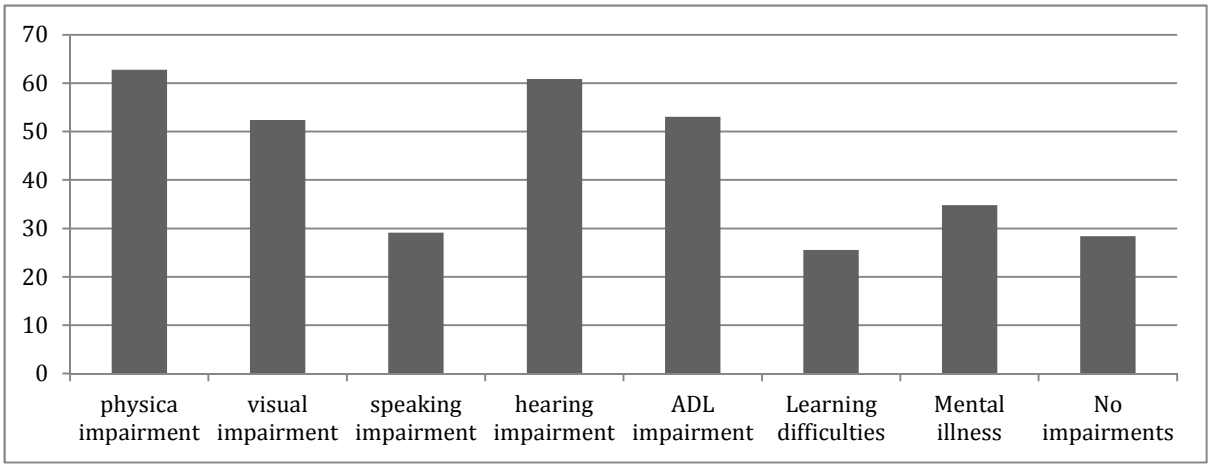
Question on disability in 2010 were asked at the individual level. In this year, 5.2% of the individuals were living with impairments. Physical impairments had the highest prevalence, with 2.81% of the population registering that they lived with this type of impairment. ADL impairments had the lowest prevalence (0.07%) (Table A6.14).

TABLE A6. 14. TYPE OF IMPAIRMENT MEXICO ENIGH 2010

	Percentage
Physical impairment	2.81
Visual impairment	1.1
Speaking impairment	0.32
Hearing impairment	0.38
ADL impairment	0.07
Learning difficulties	0.12
Mental impairments	0.38
No impairment	94.82

50% of individuals living with impairments were female, and the average age was 52, with an average age of 63 for people with physical impairments and 25 for people with learning difficulties (Figure A6. 8).

FIGURE A6. 8. AGE AND TYPE OF DISABILITY MEXICO ENIGH 2010



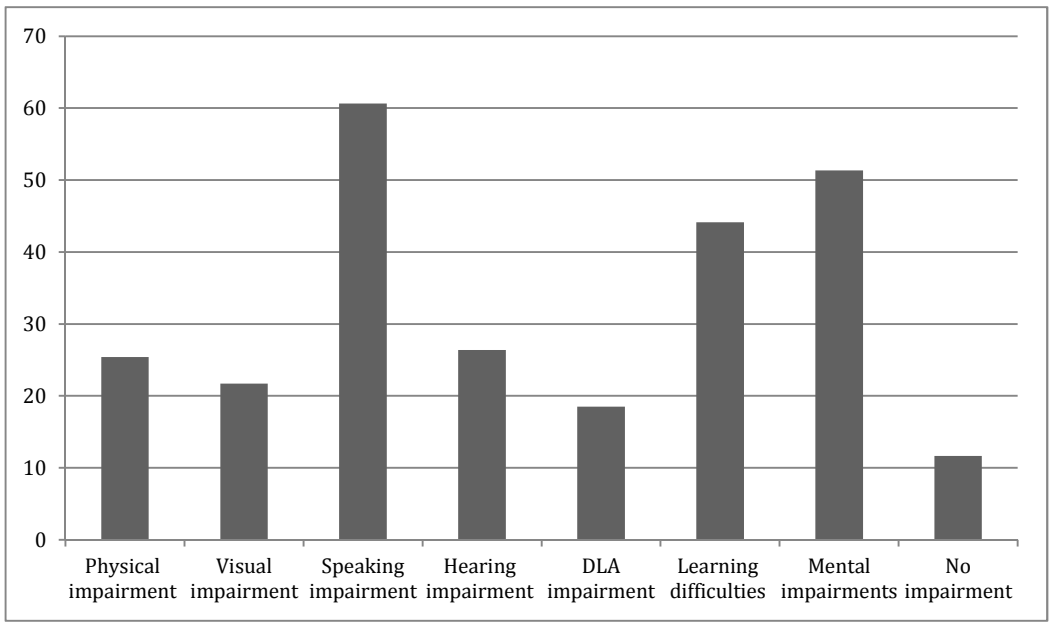
The main cause of disability was illness or disease with a 36.60% of the population reporting this as the main cause. Ageing was the reason for 28.39% of the population (Table A6.15).

TABLE A6. 15. CAUSE OF DISABILITY MEXICO ENIGH 2010

	Percentage
Congenital	17.74
illness or disease	36.6
Accident	13.69
Ageing	28.39
Other causes	3.58

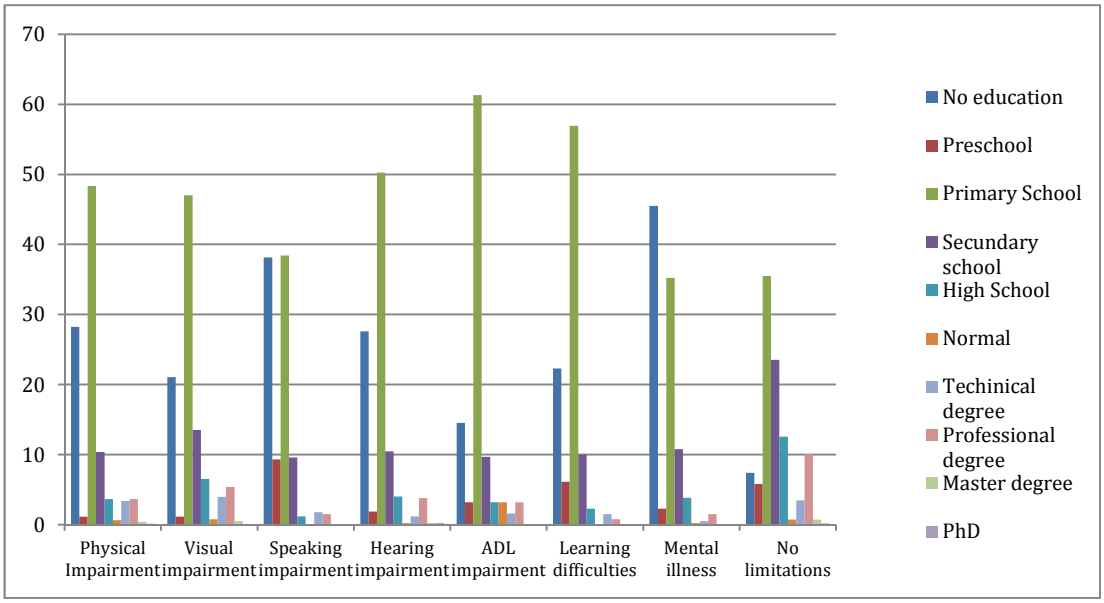
29% of individuals with impairments were illiterate, with 60.6% of people living with a difficulty to speak are illiterate (Figure A6.9).

FIGURE A6. 9. PERCENTAGE OF ILLITERATE INDIVIDUALS (DIFFERENT TYPES OF IMPAIRMENTS) MEXICO ENIGH 2010



In general, individuals with any type of impairment had an average level of education lower than individual without impairments. Indeed, 27.13% of individuals living with an impairment did not have education (Figure A6.10), with 38% individuals with speaking limitations without education. 24.7% of people living with impairments were not working the week previous to the survey.

FIGURE A6. 10. LEVEL OF EDUCATION PEOPLE WITH IMPAIRMENTS MEXICO ENIGH 2010

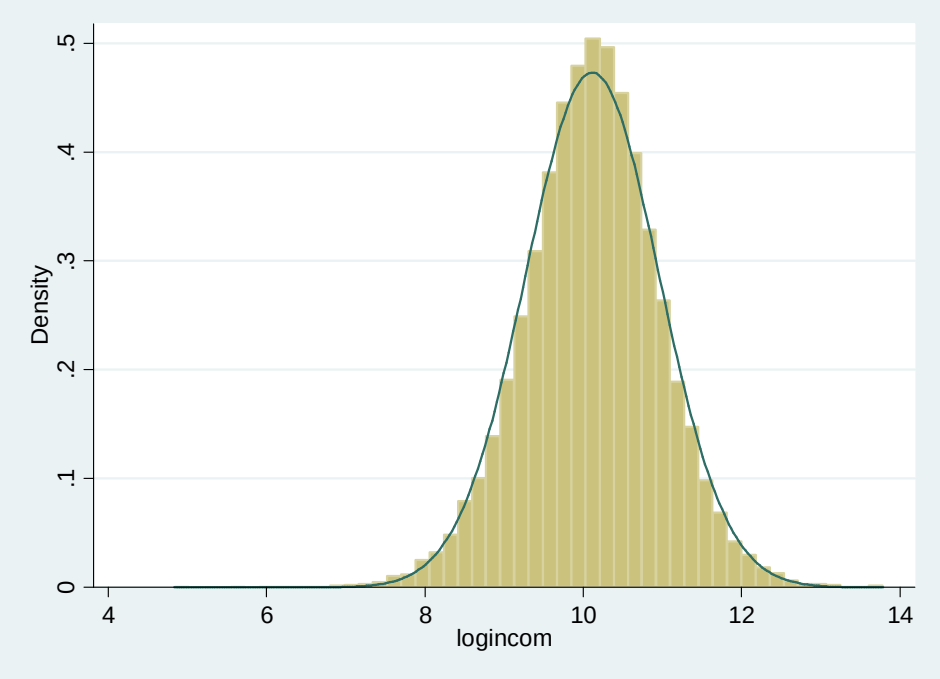


VARIABLES HOUSEHOLD MODEL

DEPENDENT VARIABLES:

Logarithm of income of the household: this variable is the logarithmic transformation of the total household income, which was the total sum of all the sources of income that a household had, including: labour income, rents, pensions and benefits from social assistance programmes (Figure A6.11).

FIGURE A6. 11. HISTOGRAM LOGARITHM INCOME MEXICO ENIGH 2010



INDEPENDENT VARIABLE:

1. *Household characteristics:*
    a. *Disability in the household*: The question related to disability was asked at the individual level. The question used was:

> In your daily living … do you have any difficulty …?
>
> 1. To walk, to move or to go down and upstairs?
> 2. To see, even when you are using glasses?
> 3. To speak, to communicate or to have a conversation?
> 4. To hear, even when you are using a hearing aid?
> 5. To take a shower, to get dress, or to eat?
> 6. To pay attention or to learn simple things?
> 7. Do you have any mental impairment?
> 8. You do not have any physical or mental difficulty

With the information from this question a dichotomous variable that represented the presence of at least one member with disability in the household was created. In 2010, 17% of individuals in Mexico

lived in households with at least one member with a disability (Table A6.16).

TABLE A6. 16. DISABILITY IN THE HOUSEHOLD MEXICO ENIGH 2010

	Percentage
Without members with disability	83.11
Withmembers with disability	16.89

b. Number of individuals older than 65 years in the household: Continuous variable that took values between 0 and 2. It represented the number of members older than 65 years per household (Table A6.17).

TABLE A6. 17. ELDERLY IN THE HOUSEHOLD MEXICO ENIGH 2010

	Percentage
0	81.35
1	12.79
2 or more	5.86

c. Number of children in a household: Continuous variable that took values between 0 and 5. It represented the number of individuals younger than 12 years old per household (Table A6.18).

TABLE A6. 18. CHILDREN HOUSEHOLD MEXICO ENIGH 2010

	Percentage
0	36.17
1	26.02
2	22.29
3	10.03
4	3.48
5 or more	2.01

d. Number of working individuals per household: Continuous variable, whose values were between 0 to 5 individuals. The person should be older than 12 years old and be working and receiving a salary (Table A6.19).

TABLE A6. 19. WORKING IN THE HOUSEHOLD MEXICO ENIGH 2010

Number of working individuals	Percentage
0	5.66
1	36.72
2	33.61
3	14.48
4	6.25
5 or more	3.28

e. Size of the household: It represented the total number of members in one household. The average number was five, with values between 1 and 21.

2. *Area:* Dichotomous variable that took the value of 1 when the person was living in urban areas and 0 in rural areas. According to the classification used in Mexico, if the town has less than 2,500 habitants it is a rural area.

3. *Region:* Dichotomous variables that represented each of the regions in Mexico. Each of them took the value of 1 when the person was living in the region and 0 otherwise. San Luis de Potosi was the reference variable.

4. Head of household characteristics:

a. Age head of the household: Continuous variable with an average of 47.7 years, and values between 12 and 97 (including 97 or more).

b. *Age squared head of the household:* Continuous variable that represented the square of the age of the head of household. It took values between 144 and 9409.

c. *Female head of the household:* Dichotomous variable that took the value of one if the head of household was female and 0 if he was a

male. 79.7% of the population lived in a household with a male head (Table A6.20).

TABLE A6. 20. SEX HEAD OF THE HOUSEHOLD MEXICO ENIGH 2010

	Percentage
Male head	79.74
Female head	20.26

d. *Level* of education of head household: Dichotomous variables that represented each of the levels of education on the head of the household. The average level of education of the head of household was complete primary school. 9.15% of individuals lived in households, whose head had no education (Table A6.21).

TABLE A6. 21. EDUCATION HEAD OF THE HOUSEHOLD MEXICO ENIGH 2010

Education head of the household	Percentage
No education	9.15
Kinder Grader	0.19
Primary incomplete	19.98
Primary complete	19.71
Secondary incomplete	4.24
Secondary complete	22.4
High School incomplete	3.3
High school complete	8.28
Professional incomplete	2.2
Professional complete	8.91
Post graduate	1.65

e. Working head of household: Dichotomous variable that took the value of 0 if the head of household was not working and one if was working and earning a salary.

f. *Head household marital status:* Dichotomous variables that represented the marital status of the head of household. Each of them took the value of one if the head of the household was single,

married, widower or divorced, and 0 if the marital status corresponded to another category.

g. *Head of the household with disability:* Dichotomous variable that took the value of 1 if the person was living in a household in which head had any type of limitation/impairment and 0 if not (Table A6.22).

TABLE A6. 22. HEAD OF THE HOUSEHOLD WITH DISABILITY MEXICO ENIGH 2010

Head disability	Percentage
0	91.93
1	8.07

5. *Poorest 40% according to the asset index:* Dichotomous variable that took the value of one if the person lived in a household that according to the asset index was in the poorest 40% and 0 in other cases.

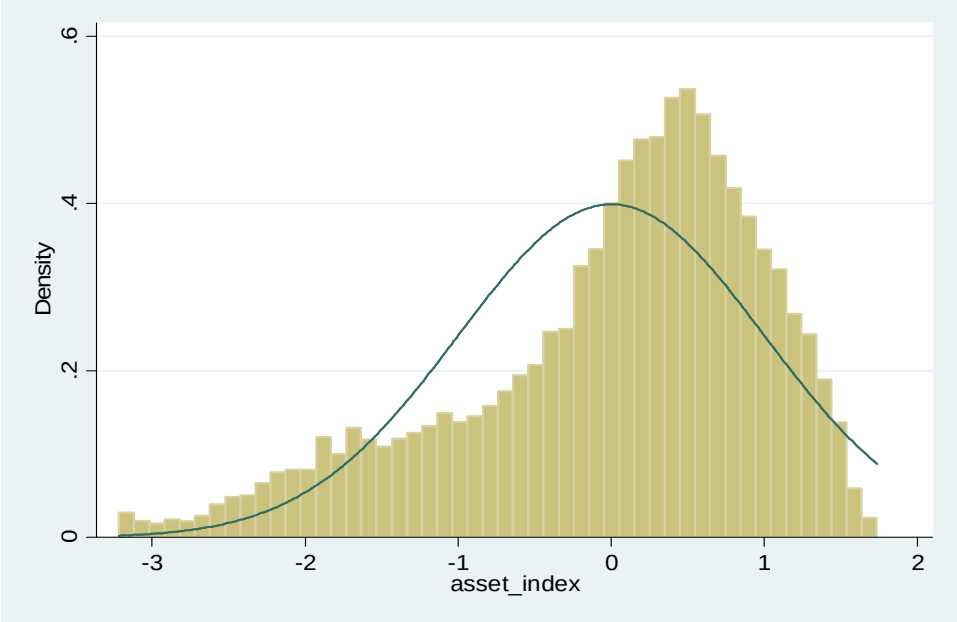
a. *Asset index:* The first component explained the variance of the variables by 18.22% (Table A6.23). The index increases when the household had better characteristics and when the household had any asset, with stove as the asset with the major contribution. Figure A6.12 presents the histogram of the asset index and figure A6.13 the contribution of each variable to the asset index in rural and urban areas.

TABLE A6. 23. FIRST COMPONENT ASSET INDEX MEXICO ENIGH 2010

Variable	First component
Walls material: Rubbish	-0.0209
Walls material: Reed, bamboo, asbestos, carton, other materials	-0.0677
Walls material: wood	-0.1066
Walls material: Adobe	-0.0932
Walls material: Brick	0.1652
Floor material: Earth	-0.1067
Floor material: Cement	-0.1337
Floor material: Wood, marble others	0.1839
Water source: Inside the dwelling	0.2271

Water source: Outside the household	-0.1627
water source: Other pipe	-0.0433
Water source: Well	-0.0317
Water source: Others	-0.1173
Public sewerage	0.1855
Septic fosse	-0.0692
Tube to river or other place	-0.0297
No sewerage	-0.1793
Public source electricity	0.1127
Other source electricity	-0.0624
No electricity	-0.0959
Energy cooking: Firewood	-0.2493
Energy cooking: Gas	0.2126
Energy cooking: Natural gas	0.0536
Energy cooking: Electricity	-0.0059
Energy cooking: Other sources	-0.0146
Waste collection: Public system	0.203
Waste collection: Drop	0.0046
waste collection: burn	-0.2104
Waste collection: Bury	-0.0433
Waste collection: Other	-0.053
Stereo	0.1276
Tape recorder	0.0413
Radio	0.0008
TV	0.1615
DVD	0.1507
VCR	0.0793
Blender	0.1837
Microwave	0.1875
Fridge	0.2048
Stove	0.2297
Washing machine	0.1939
Iron	0.1934
Sewing machine	0.0718
Ventilator	0.1052
Vacuum	0.1034
PC	0.1861
Printer	0.15
internet	0.1655
Cell phone	0.1703
Motorcycle	0.0207
Car	0.1565
Toaster	0.1188

FIGURE A6. 12. HISTOGRAM ASSET INDEX MEXICO ENIGH 2010



6. *Type of ownership of the dwelling:*

    a. *Own the property:* Dichotomous variable that took the value of one if the person was living in a house that they own and zero in other cases. It included the options of own the house and owns the house but is paying a mortgage.

    b. *Rent the property:* Dichotomous variable that took the value of one when the person was living in a dwelling and paying rent and 0 in other cases.

    c. *Borrow the property and other:* Dichotomous variable that took the value of one if the person was living in a dwelling and was not paying rent and did not own it. This was used as the base variable.

7. *No school attendance:* Dichotomous variable that represented the existence of at least one child of school age (older than three and younger than 15) that did not attend school (Table A6.24).

TABLE A6. 24. SCHOOL ATTENDANCE MEXICO ENIGH 2010

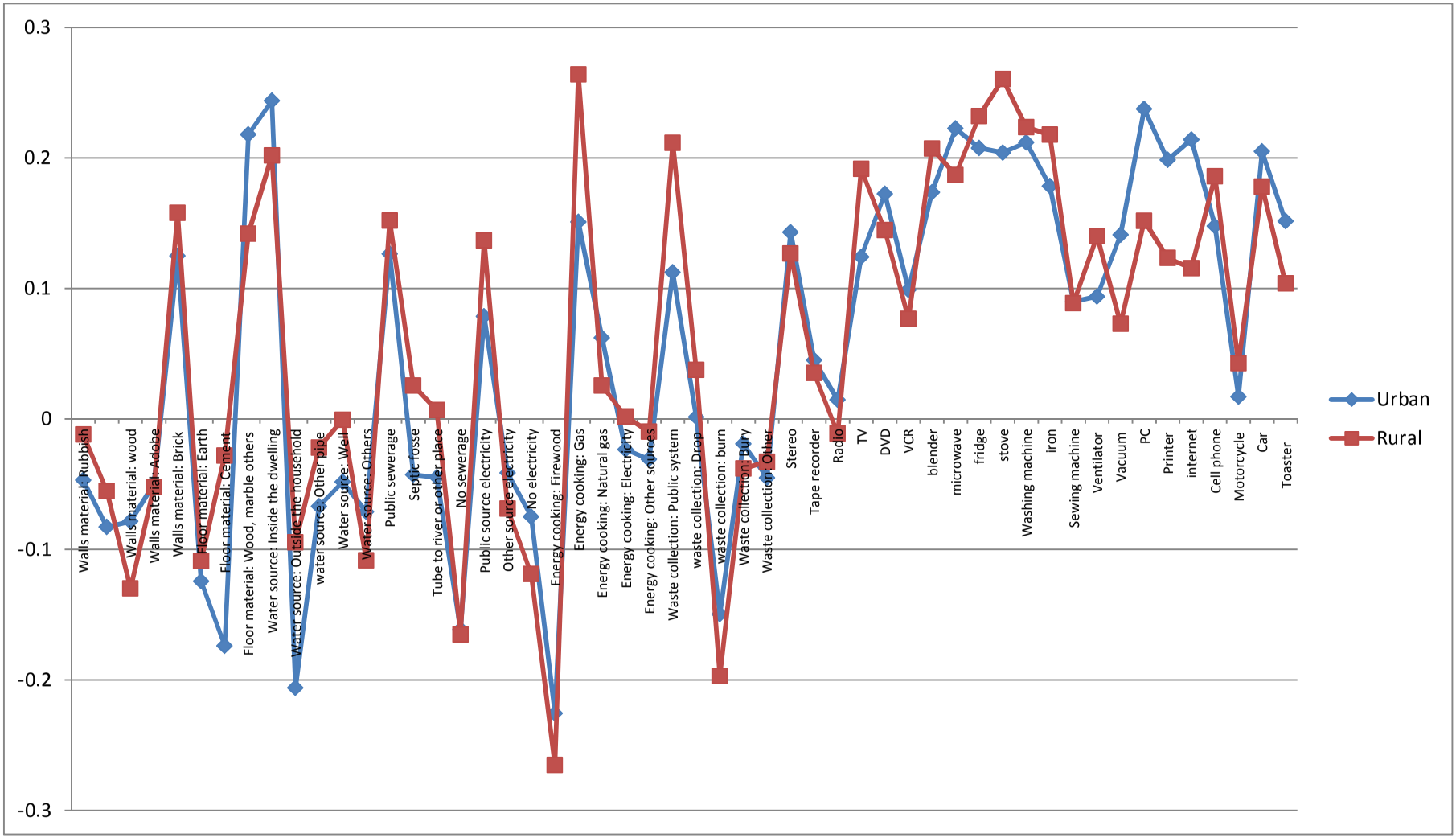
	Percentage
Child attended	86.8
Child no attended	13.2

8. *Food insecurity*: Dichotomous variable that took the value of one when at least one adult of the household was hungry and did not eat for financial reasons (Table A6.25). This is considered to be moderate food insecurity according to the FAO.

TABLE A6. 25. FOOD INSECURITY MEXICO ENIGH 2010

Food insecurity	**Percentage**
No	82.21
Yes	17.79

FIGURE A6. 13. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS MEXICO ENIGH 2010



CROSS-SECTIONAL ANALYSIS

RESULTS 2010: MODEL A

Regression

Dependent variable: Logarithm household income

Independent variable: Disability in the household

TABLE A6. 26. RESULTS REGRESSION MODEL A: DEPENDENT VARIABLE: LOGARITHM HOUSEHOLD INCOME. INDEPENDENT VARIABLE: DISABILITY IN THE HOUSEHOLD. MEXICO ENIGH 2010

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Number children household	-0.15***	-0.11***	-0.06***	-0.06***	-0.05***	-0.05***	-0.04***
Number elderly household	-0.01	0.01**	0.02***	0.01**	0.01*	0.01	0
Number working household	0.20***	0.19***	0.21***	0.21***	0.20***	0.20***	0.20***
Disability in the household	-0.14***	-0.13***	-0.07***	-0.07***	-0.05***	-0.04***	-0.04***
Size household	0.03***	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***
Aguas Calientes		0.39***	0.35***	0.35***	0.26***	0.27***	0.27***
Baja California		0.47***	0.48***	0.47***	0.40***	0.41***	0.41***
Baja California South		0.61***	0.56***	0.55***	0.42***	0.42***	0.42***
Campeche		0.16***	0.18***	0.16***	0.19***	0.18***	0.18***
Ciahuila		0.30***	0.27***	0.25***	0.19***	0.18***	0.19***
Colima		0.43***	0.42***	0.44***	0.34***	0.34***	0.34***

Chiapas		-0.17***	-0.13***	-0.14***	-0.13***	-0.14***	-0.13***
Chihuahua		0.15***	0.14***	0.14***	0.06***	0.06***	0.06***
Distrito Federal		0.54***	0.40***	0.41***	0.33***	0.33***	0.33***
Durango		0.11***	0.11***	0.09***	0.04**	0.03*	0.04*
Guanajuato		0.17***	0.22***	0.21***	0.11***	0.11***	0.12***
Guerrero		-0.20***	-0.15***	-0.17***	-0.11***	-0.11***	-0.12***
Hidalgo		0.09***	0.09***	0.08***	0.08***	0.07***	0.07***
Jalisco		0.36***	0.38***	0.40***	0.28***	0.28***	0.28***
Mexico		0.24***	0.23***	0.23***	0.21***	0.20***	0.20***
Michiacan		0.10***	0.17***	0.17***	0.11***	0.11***	0.12***
Morelos		0.25***	0.22***	0.22***	0.23***	0.22***	0.22***
Nayarit		0.17***	0.12***	0.12***	0.08***	0.07***	0.07***
Nuevo Leon		0.55***	0.48***	0.49***	0.38***	0.38***	0.38***
Oaxaca		-0.09***	-0.07***	-0.08***	-0.03	-0.04***	-0.04**
Puebla		0.01	0.07***	0.07***	0.05***	0.05***	0.05***
Queretaro		0.43***	0.42***	0.41***	0.32***	0.31***	0.31***
Quintana Roo		0.41***	0.41***	0.41***	0.39***	0.38***	0.38***
Sinaloa		0.42***	0.35***	0.33***	0.22***	0.22***	0.22***
Sonora		0.38***	0.31***	0.29***	0.22***	0.23***	0.23***
Tabasco		0.21***	0.18***	0.18***	0.18***	0.18***	0.18***
Tamaulipas		0.18***	0.15***	0.14***	0.08***	0.06***	0.07***
Tlaxcala		0.15***	0.15***	0.14***	0.11***	0.11***	0.11***
Veracruz		0.16***	0.16***	0.15***	0.13***	0.12***	0.13***
Yucatan		0.12***	0.13***	0.11***	0.10***	0.09***	0.09***
Zacatecas		0.14***	0.14***	0.14***	0.07***	0.06***	0.06***
Urban		0.63***	0.40***	0.43***	0.25***	0.26***	0.26***
Head female			0.07***	0.07***	0.06***	0.06***	0.06***
Age head			0.02***	0.01***	0.00***	0.01***	0.01***
Age head square			-0.00***	-0.00***	0	0	0

Incomplete primary school head			0.18***	0.17***	0.12***	0.11***	0.11***
Complete primary school head			0.36***	0.35***	0.24***	0.23***	0.22***
Incomplete secondary school head			0.42***	0.43***	0.28***	0.27***	0.27***
Complete secondary school head			0.59***	0.58***	0.40***	0.39***	0.38***
Incomplete high school head			0.65***	0.66***	0.43***	0.42***	0.41***
Complete high school head			0.81***	0.81***	0.57***	0.54***	0.54***
Incomplete undergraduate head			1.09***	1.09***	0.84***	0.81***	0.80***
Complete undergraduate head			1.36***	1.35***	1.08***	1.06***	1.05***
Post graduate studies head			1.77***	1.76***	1.49***	1.46***	1.46***
Divorce head			0.13***	0.11***	0.08***	0.08***	0.08***
Widower head			0.06***	0.06***	0.04***	0.04***	0.04***
Married head			0.10***	0.08***	0.06***	0.06***	0.05***
Working head household			-0.11***	-0.10***	-0.08***	-0.09***	-0.09***
Rent house				-0.08***	-0.11***	-0.11***	-0.11***
Own house				0.13***	0.10***	0.09***	0.09***
Poorest 40					-0.47***	-0.44***	-0.44***
Food insecurity						-0.19***	-0.19***
No school attendance							-0.07***
Constant	9.78***	9.02***	7.92***	8.01***	8.76***	8.78***	8.78***
ll	-1.25E+05	-1.11E+05	-94871.59	-94185.52	-89240.3	-88452.8	-88369.7

r2	1.30E-01	3.20E-01	0.5	0.51	0.55	0.56	0.56
aic	249198	222352.4	189851.18	188483.05	178594.7	177021.7	176857.5
bic	249255.4	222715.9	1.90E+05	189018.8	1.79E+05	1.78E+05	177421.9

***p-value>0.01; **>0.05; *>0.1

RESULTS 2010: MODEL B

Regression

Dependent variable: Logarithm household income

Independent variable: Head of the household with disability

TABLE A6. 27. RESULTS REGRESSION MODEL B: DEPENDENT VARIABLE: LOGARITHM HOUSEHOLD INCOME. INDEPENDENT VARIABLE: HEAD OF THE HOUSEHOLD WITH DISABILITY. MEXICO ENIGH 2010

Variable	Model 8	Model 9	Model 10	Model 11	Model 12
Number children household	-0.06***	-0.06***	-0.05***	-0.05***	-0.04***
Number elderly household	0.01	0	0	0	0
Number working household	0.21***	0.21***	0.20***	0.20***	0.20***
Size household	0.05***	0.05***	0.05***	0.05***	0.05***
Aguas Calientes	0.35***	0.35***	0.27***	0.27***	0.27***
Baja California	0.47***	0.47***	0.40***	0.40***	0.41***
Baja California South	0.56***	0.55***	0.42***	0.42***	0.42***
Campeche	0.18***	0.16***	0.19***	0.18***	0.18***
Ciahuila	0.27***	0.25***	0.19***	0.18***	0.19***
Colima	0.42***	0.44***	0.34***	0.34***	0.34***
Chiapas	-0.13***	-0.14***	-0.13***	-0.14***	-0.13***
Chihuahua	0.14***	0.14***	0.06***	0.06***	0.06***
Distrito Federal	0.40***	0.41***	0.33***	0.33***	0.33***
Durango	0.10***	0.09***	0.04**	0.03*	0.03*
Guanajuato	0.22***	0.21***	0.12***	0.11***	0.12***
Guerrero	-0.15***	-0.17***	-0.11***	-0.11***	-0.12***
Hidalgo	0.09***	0.08***	0.08***	0.07***	0.07***
Jalisco	0.38***	0.40***	0.28***	0.28***	0.28***

Mexico	0.23***	0.23***	0.21***	0.20***	0.20***
Michiacan	0.17***	0.17***	0.11***	0.11***	0.12***
Morelos	0.22***	0.22***	0.23***	0.22***	0.22***
Nayarit	0.12***	0.12***	0.08***	0.07***	0.07***
Nuevo Leon	0.48***	0.49***	0.38***	0.38***	0.38***
Oaxaca	-0.07***	-0.08***	-0.03*	-0.04***	-0.04**
Puebla	0.07***	0.07***	0.05***	0.05***	0.05***
Queretaro	0.42***	0.41***	0.32***	0.31***	0.31***
Quintana Roo	0.41***	0.41***	0.39***	0.38***	0.38***
Sinaloa	0.35***	0.33***	0.22***	0.22***	0.22***
Sonora	0.31***	0.29***	0.22***	0.23***	0.23***
Tabasco	0.18***	0.18***	0.17***	0.18***	0.18***
Tamaulipas	0.14***	0.14***	0.08***	0.06***	0.06***
Tlaxcala	0.15***	0.13***	0.11***	0.11***	0.11***
Veracruz	0.15***	0.15***	0.13***	0.12***	0.13***
Yucatan	0.13***	0.11***	0.10***	0.09***	0.09***
Zacatecas	0.14***	0.14***	0.07***	0.06***	0.06***
Urban	0.40***	0.43***	0.25***	0.26***	0.26***
Head female	0.07***	0.07***	0.05***	0.06***	0.06***
Age head	0.02***	0.01***	0.00***	0.00***	0.00***
Age head square	-0.00***	-0.00***	0	0	0
Head disability	-0.11***	-0.10***	-0.08***	-0.07***	-0.07***
Incomplete primary school head	0.18***	0.17***	0.12***	0.11***	0.11***
Complete primary school head	0.36***	0.35***	0.24***	0.22***	0.22***
Incomplete secondary school head	0.42***	0.43***	0.28***	0.27***	0.27***
Complete secondary school head	0.59***	0.58***	0.40***	0.39***	0.38***
Incomplete high school head	0.65***	0.66***	0.43***	0.42***	0.41***
Complete high school head	0.81***	0.81***	0.57***	0.54***	0.54***
Incomplete undergraduate head	1.09***	1.09***	0.84***	0.81***	0.80***

Complete undergraduate head	1.36***	1.35***	1.08***	1.06***	1.05***
Post graduate studies head	1.77***	1.76***	1.49***	1.46***	1.45***
Divorce head	0.14***	0.11***	0.08***	0.08***	0.08***
Widower head	0.07***	0.06***	0.04***	0.04***	0.04***
Married head	0.10***	0.08***	0.06***	0.06***	0.06***
Working head household	-0.11***	-0.11***	-0.09***	-0.09***	-0.09***
Rent house		-0.08***	-0.11***	-0.11***	-0.11***
Own house		0.13***	0.10***	0.09***	0.09***
Poorest 40			-0.47***	-0.44***	-0.44***
Food insecurity				-0.19***	-0.19***
No school attendance					-0.07***
Constant	7.95***	8.04***	8.78***	8.80***	8.80***
ll	-9.49E+04	-9.42E+04	-8.92E+04	-8.84E+04	-8.83E+04
r2	5.00E-01	5.10E-01	5.50E-01	5.60E-01	5.60E-01
AIC	189833.2	188453	178564.6	176979.7	176809.5
BIC	190349.8	188988.7	179109.9	177534.6	177374

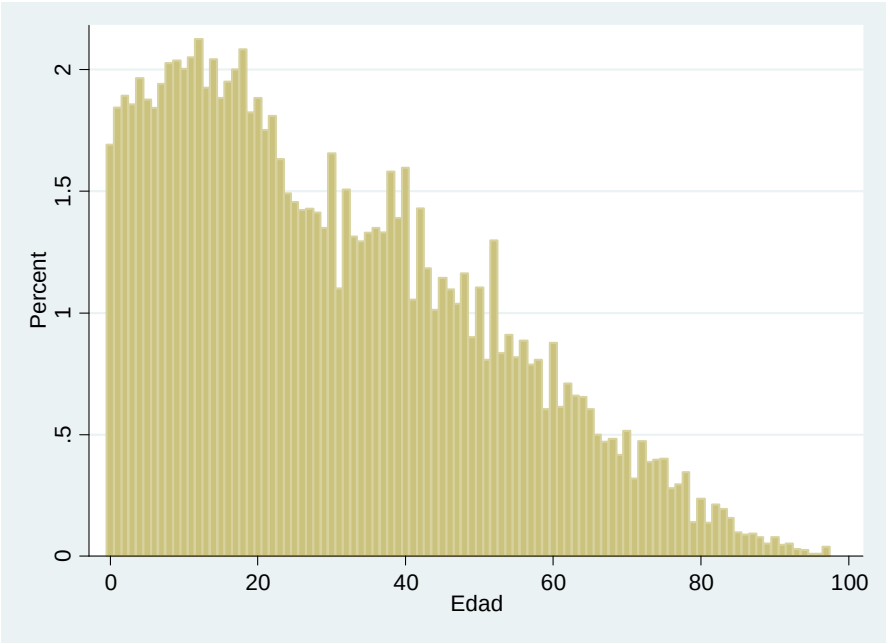
***p-value>0.01; **>0.05; *>0.1

MEXICO ENIGH 2012

DESCRIPTIVE STATISTICS

In 2012, 51.25% of the population was female, with an average age of 30 years (Figure A6. 14). 31.2% of the population was from an ethnic minority and the average education level was primary school.

FIGURE A6. 14. HISTOGRAM AGE MEXICO ENIGH 2012



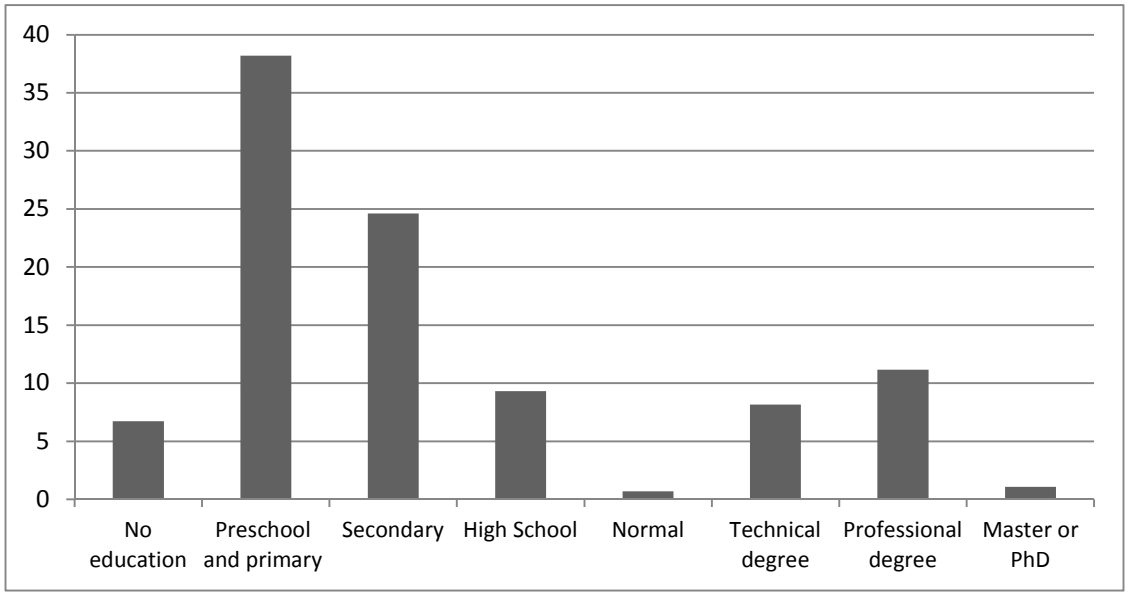
49% of the population lived in a middle low socioeconomic level. Of those living in urban areas, only 7% were living in a low socioeconomic status, in contrast 70% of people living in rural areas were in this socioeconomic status (Table A6.28).

TABLE A6. 28. SOCIOECONOMIC LEVEL MEXICO ENIGH 2012

	Percentage
Low	31.55
Middle low	48.93
Middle high	14.95
High	4.57

76.8% of individuals were living in urban areas, with State of Mexico as the region with the highest population. The average level of education was primary school. 6.7% of the population did not have any education and 12.2% were illiterate and 1.1% had a graduate degree (Figure A6.15).

FIGURE A6. 15. EDUCATION LEVEL MEXICO ENIGH 2012



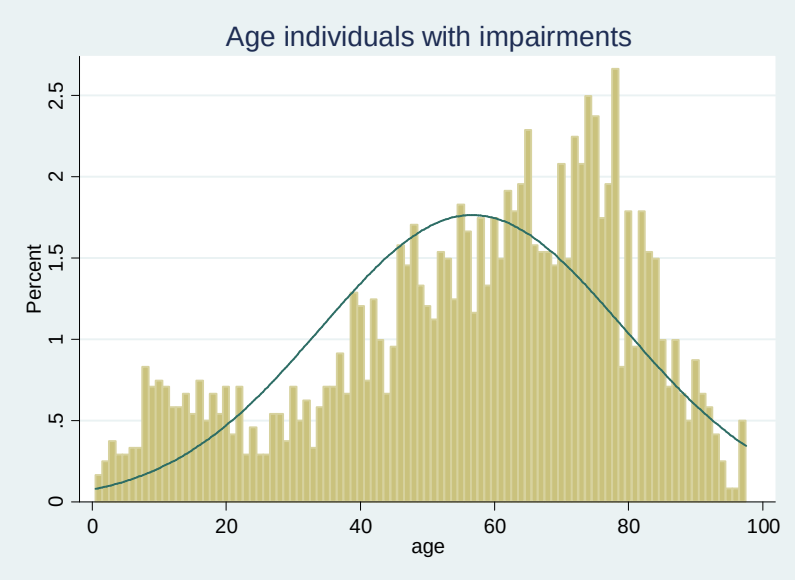
Of the total population, 6.6% had any type of impairment. Physical impairments were the most prevalent in 2012 with 3.81% of the population (Table A6.29). 1.5% of individuals were living with visual impairments; ADL impairment had the lowest prevalence. The main causes of impairment were disease (38.5%) and ageing (27.5%).

TABLE A6. 29. TYPE OF IMPAIRMENT MEXICO ENIGH 2012

	Percentage
Physical impairment	3.81
Visual impairment	1.47
Speaking impairment	0.28
Hearing impairment	0.5
ADL impairment	0.09
Learning difficulties	0.15
Mental impairment	0.34
No impairment	93.37

52.25% of individuals with impairment were female, this percentage varied between type of impairments. In the case of ADL limitation, 59% were female, and 35% of individuals with mental illness were female. The average age of individuals with disability was 56.25 (Figure A6.16). Differences in the average age between types of impairments were evident, indeed, the average age of individuals with learning limitations was 26 years, and for individuals with ADL limitations was 67 years old.

FIGURE A6. 16. HISTOGRAM AGE INDIVIDUALS WITH IMPAIRMENTS MEXICO ENIGH 2012



Of the total population living with any type of impairment, 28.4% did not have any education, and 45.7% had a maximum level of complete primary school (Table A6.30). 30.8% of individuals with impairments were illiterate. Important differences between the illiterate rates existed between types of impairments. In fact, 62% of individuals with mental illness were illiterate and 50% of individuals with speaking impairments were also illiterate.

TABLE A6. 30. EDUCATION PEOPLE WITH IMPAIRMENTS MEXICO ENIGH 2012

	Percentage
No education	28.4
Preschool to primary school	45.68
Secondary school	11.89
High school	4.45
Normal	0.71
Technical	4.71
Professional	3.85
Master or PhD	0.3

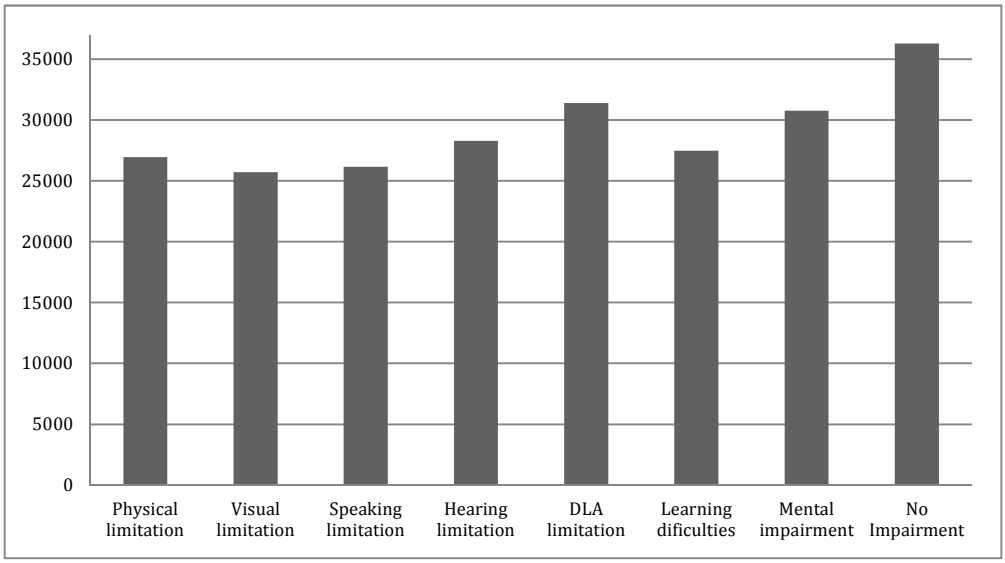
38% of individuals with impairment, older than 12 years old were working, percentage that is smaller compared to 60.4% of people without impairments that were working (Table A6. 31).

TABLE A6. 31.PEOPLE WITH AND WITHOUT DISABILITY WORKING MEXICO ENIGH 2012

	No disability	Disability
No working	39.56	62.50
Working	60.44	38

The mean income of people with impairments was lower than for people without impairments (Figure A6.17). In addition, families with at least one member with visual impairment had a lower level of income than other families.

FIGURE A6. 17. MEAN INCOME BY TYPE OF IMPAIRMENT MEXICO ENIGH 2012

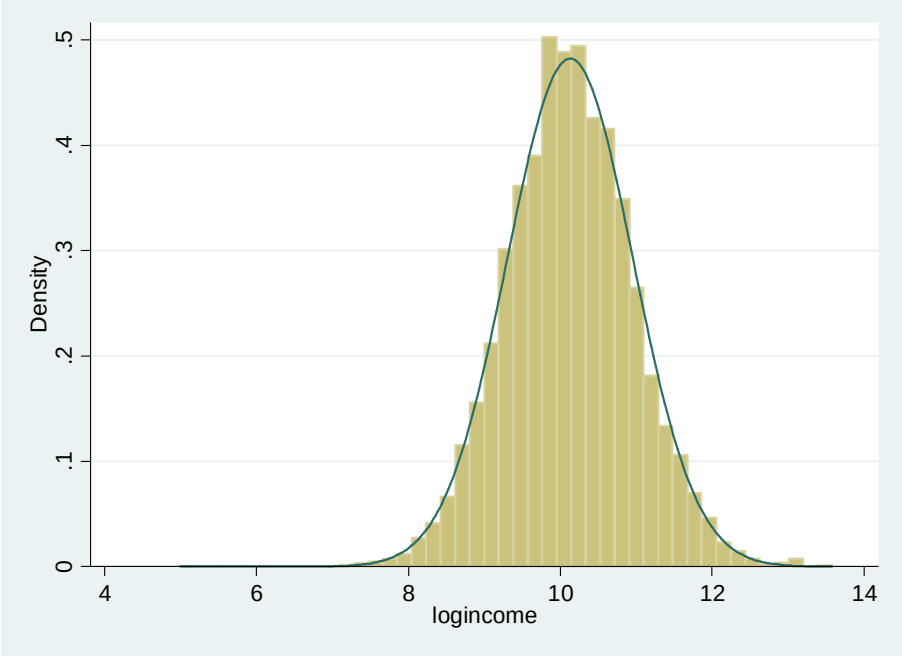


VARIABLE HOUSEHOLD MODEL

DEPENDENT VARIABLES

Logarithm of household income: Variable created using the total household income, which was the total sum of all sources of income that a household had including: labour income, rents, pensions and benefits from social assistance programmes (Figure A6.18).

FIGURE A6. 18. HISTOGRAM LOGARITHM HOUSEHOLD INCOME MEXICO ENIGH 2012



INDEPENDENT VARIABLES:

1. *Household characteristics*:

    a. *Disability in the household*: Questions on disability were asked at the individual level. The question used was the same as in 2010. This variable was dichotomous and represented the presence of at least one member with disability in the household (Table A6.32).

TABLE A6. 32. DISABILITY IN THE HOUSEHOLD MEXICO ENIGH 2012

	Percentage
Households without disabled members	80.33
Households with disabled member	19.67

b. Number of individuals older than 65 years in the household: Continuous variable that took values between 0 and 13. It represented the count of the number of individuals older than 65 years old in a household (Table A6.33).

TABLE A6. 33. ELDERLY HOUSEHOLD MEXICO ENIGH 2012

Number older 65	Percentage
1	4.4
2	28.32
3	22.92
4	21.44
5	12.92
6	5.58
7	2.28
8 or more	2.14

c. *Number of children in a household:* Continuous variable that took values between 0 and 4. It represented the number of individuals younger than 12 years old per household (Table A6.34).

TABLE A6. 34. CHILDREN HOUSEHOLD MEXICO ENIGH 2012

Number of children	Percentage
0	38.33
1	26.36
2	20.69
3	10.17
4 or more	4.45

d. Number of working individuals per household: Continuous variable, whose values were between 0 to 5 individuals. The person should be older than 12 years old and be working and receiving a salary (Table A6.35).

TABLE A6. 35. WORKING INDIVIDUALS PER HOUSEHOLD MEXICO ENIGH 2012

Number working members	Percentage
0	4.71
1	34.13
2	35.14
3	15.32
4	6.36
5 or more	4.33

e. Size of the household: It represented the total number of members in one household. The average was 5, with values between 1 and 21.

2. *Area:* Dichotomous variable that took the value of 1 when the person was living in urban area and 0 in rural area. According to the classification used in Mexico, if the town has less than 2500 inhabitants it is a rural area.

3. *Region:* Dichotomous variables that represented each of the regions in Mexico. Each of them took the value of 1 when the person lived in that region and 0 when not.

4. *Head of household characteristics*:

    a. *Age head of the household*: Continuous variable with an average of 47.8 years, and values between 12 and 97 (97 or more).

    b. *Age squared head of the household*: Continuous variable that represented the square of the age of the head of household. It took values between 144 and 9409.

    c. *Female head of the household*: Dichotomous variable that took the value of 1 if the head of household was female and 0 if he was a male. 78.61% of the population lived in a household with a male head (Table A5.36).

TABLE A6. 36. SEX HEAD OF THE HOUSEHOLD MEXICO ENIGH 2012

	Percentage
Male head	78.61
Female head	21.39

    d. *Level of education of the head household:* The average level of education of the head of household was secondary incomplete. 8.87 % of individuals lived in households, whose head had no education (Table A6.37).

TABLE A6. 37. EDUCATION HEAD OF THE HOUSEHOLD MEXICO ENIGH 2012

Education head	Percentage
No education	8.87
Primary school incomplete	18.91
Primary school complete	18.92
Secondary school incomplete	3.96
Secondary school complete	24.37
High school incomplete	2.88
High school complete	9.25
Professional incomplete	2.99
Professional complete	8.03
Post graduate	1.82

e. *Working head of household:* Dichotomous variable that took the value of 0 if the person was living in a household, whose head was not working and one if s/he was working and earning a salary. 81.3% of individuals lived in households, whose head was working.

f. *Head household marital status:* Dichotomous variables that represented the marital status of the head of household. Each of them took the value of one if the head of the household was single, married, widower or divorced, and 0 if the marital status corresponded to another category.

g. *Head household with disability:* Dichotomous variable that took the value of one if the person was living in a household, whose head had an impairment and 0 if not (Table A6.38).

TABLE A6. 38. DISABILITY HEAD OF THE HOUSEHOLD MEXICO ENIGH 2012

Head of the household with disability	Percentage
No	8.02
Yes	10.98

5. *Poorest 40% according to the asset index:* Dichotomous variable that took the value of one if the person lived in a household that according to the asset index was in the poorest 40% and 0 otherwise.

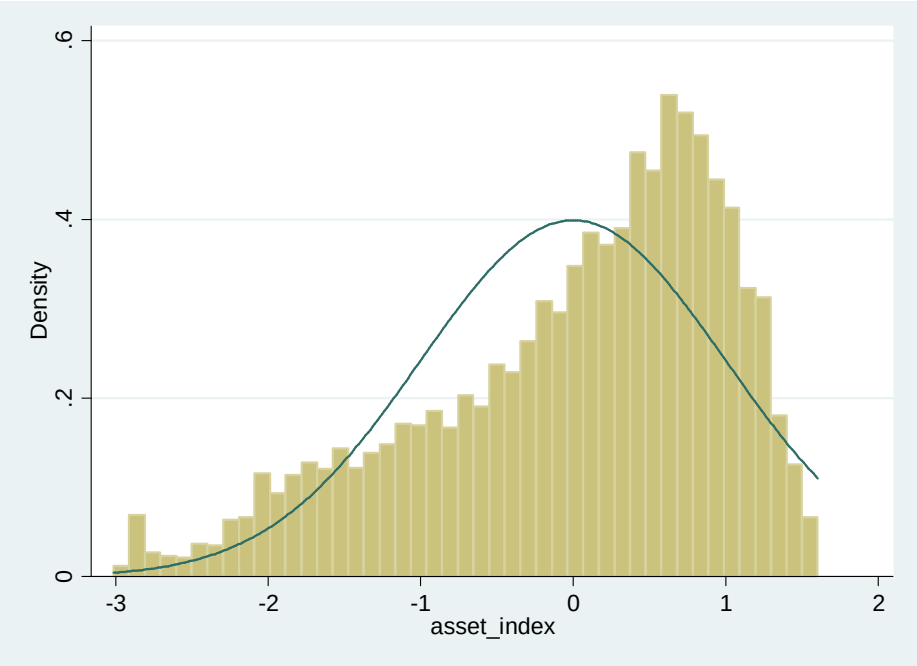
    a. A*sset index*: Index that combines information related to ownership of assets and characteristics of the dwelling. Each variable included was dichotomous, took the value of one when the household owned an asset or the dwelling had a specific characteristic and 0 if not. The first component explained the variance of the variables by 15.0%. Even though the first component did not explain completely the variance of the variables, and some of the values of this component were small, the signs were the expected (Table A6.39). Figure A6.18 presents the histogram of the index and Figure A6.19 the contribution of each variable to the asset in urban and rural areas.

TABLE A6. 39. FIRST COMPONENT ASSET INDEX MEXICO ENIGH 2012

Variable	First Component
Walls material: Rubbish	-0.0197
Walls material: Metal sheet	-0.028
Walls material: Bamboo	-0.0585
Walls material: Other materials	-0.0512
Walls material: Wood	-0.1009
Walls material: Adobe	-0.1072
Walls material: Brick	0.1786
Roofs material: Carton	-0.0756
Roofs material: sheet metal	-0.1457
Roofs material: Asbestos	-0.037
roofs material: Straw	-0.0813
Roofs material: Wood	0.0103
Roof material: terajo	-0.0297
Roof material: tiling	-0.0492
Roof material: concrete	0.203

Floor material: Earth	-0.0949
Floor material: Cement	-0.1477
Floor material: Wood	0.1917
Water source: Inside the dwelling	0.2374
Water source: Outside the household	-0.1672
Water source: Public water tap	-0.0113
Water source: Other house	-0.0347
Water source: Other pipe	-0.0207
Water source: Well	-0.1247
Public sewerage	0.2015
Septic fosse	-0.0874
Gully (barranca)	-0.0295
Tube to river or other place	-0.0107
No sewerage	-0.1771
Source of energy: Public system	0.1212
Source electricity: electric plant	-0.0114
Source electricity: Other	-0.122
Waste collection: Public system	0.1933
Waste collection: waster container	-0.0296
Waste collection: Public dumpster	0.0347
waste collection: burn	-0.2052
Waste collection: Bury	-0.0399
Waste collection: Drop	-0.0458
Energy cooking: Firewood	-0.2472
Energy cooking: Coal	-0.0124
Energy cooking: Gas	0.2099
Energy cooking: Natural gas	0.0615
Energy cooking: Electricity	0.0028
Energy cooking: Other sources	-0.0158
Car	0.1478
Motorcycle	0.0059
Tumbril	0.0067
Radio	-0.0078
Tape recorder	0.0394
Stereo	0.1095
TV	0.1661
DVD	0.1211
Bleeder	0.1711
Toaster	0.114
Microwave	0.1768
Fridge	0.2028
Stove	0.2248
Washing machine	0.1865
Iron	0.1928
Sewing machine	0.0593
Ventilator	0.1085
Vacuum	0.0914
PC	0.1732
Printer	0.1302

FIGURE A6. 19. HISTOGRAM ASSET INDEX MEXICO ENIGH 2012



6. *Type of ownership of the dwelling*:

    a. *Own the property*: Dichotomous variable that took the value of one if the family owned the house and 0 if not. It included the options of own the house and owns the house but is paying a mortgage.

    b. *Rent the property*: Dichotomous variable that took the value of one if the family lived in a rented house or a flat and 0 otherwise.

    c. *Borrow and other*: Dichotomous variable that took the value of one if the family lived in a borrow house or other conditions and 0 if the house was rented or owned.

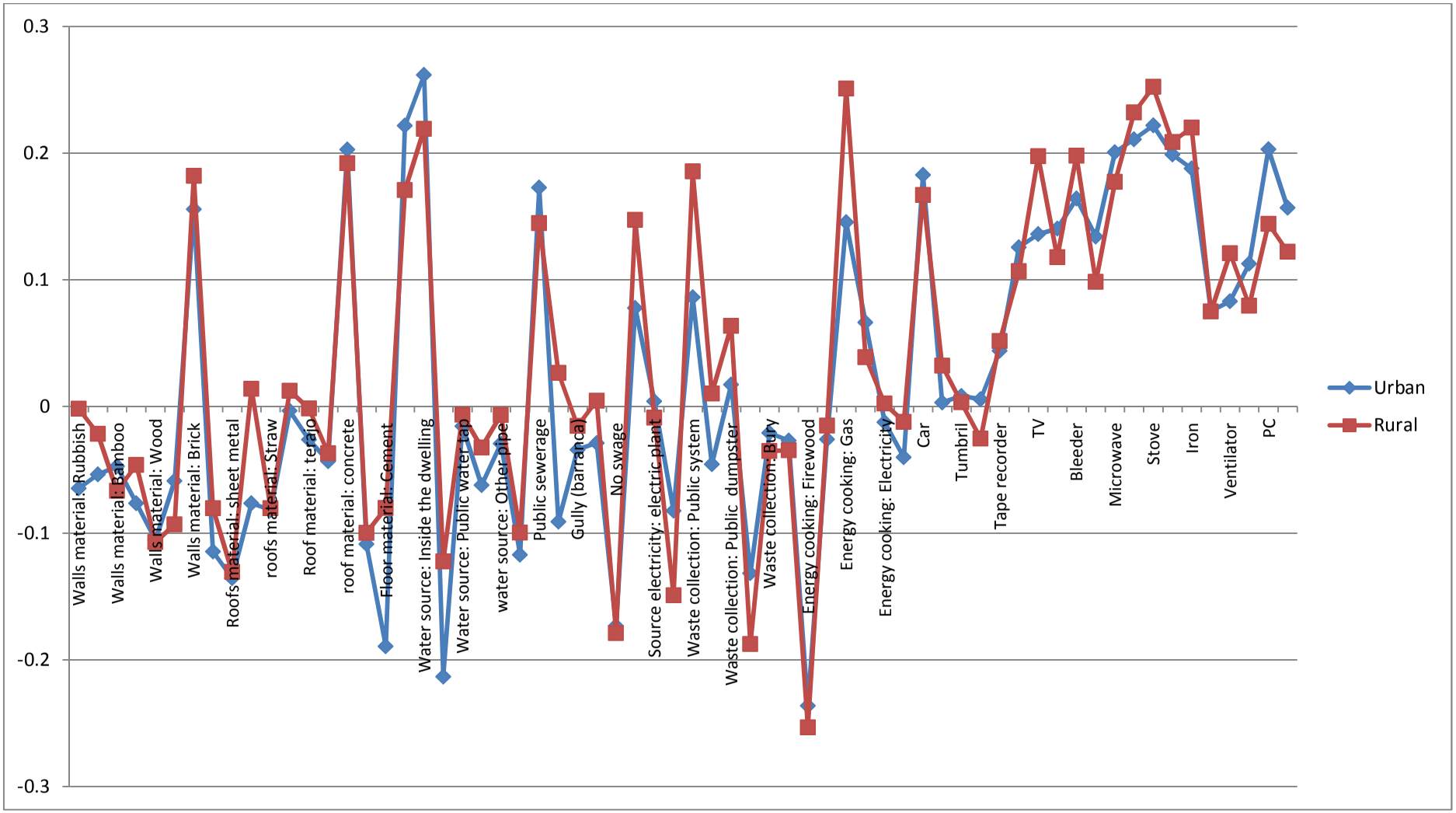
7. *No school attendance*: Dichotomous variable that represented the presence of at least one child of school age not attending school.

8. *Food insecurity:* Dichotomous variable that took the value of one when at least one adult of the household was hungry and did not eat for financial reasons (moderate food insecurity) (Table A6.40).

TABLE A6. 40. FOOD INSECURITY MEXICO ENIGH 2012

Food insecurity	Percentage
No	82.04
Yes	17.96

FIGURE A6. 20. DISTRIBUTION ASSET INDEX IN RURAL AND URBAN AREAS MEXICO ENIGH 2012



CROSS-SECTIONAL ANALYSIS

RESULTS 2012: MODEL A

Regression

Dependent variable: Natural logarithm of household income

Independent variable: Disability in the household.

TABLE A6. 41. RESULTS MODEL A. REGRESSION LOGARITHM HOUSEHOLD INCOME MEXICO ENIGH 2012 (INDEPENDENT VARIABLE: DISABILITY IN THE HOUSEHOLD)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Number elderly household	0.14***	0.13***	0.10***	0.10***	0.09***	0.09***	0.09***
Number children household	-0.04***	0.01*	0.03***	0.03***	0.02***	0.02***	0.03***
Number working household	0.12***	0.14***	0.18***	0.18***	0.18***	0.18***	0.18***
Disability in the household	-0.22***	-0.14***	-0.08***	-0.08***	-0.07***	-0.05***	-0.05***
Size household	-0.05***	-0.05***	-0.02***	-0.03***	-0.01***	-0.01***	-0.01***
Urban		0.54***	0.33***	0.35***	0.19***	0.20***	0.20***
Aguas Calientes		0.21***	0.17***	0.17***	0	0	0.01
Baja California		0.49***	0.38***	0.38***	0.28***	0.27***	0.28***
Baja California South		0.50***	0.41***	0.41***	0.32***	0.32***	0.33***
Campeche		0.21***	0.18***	0.17***	0.17***	0.16***	0.16***
Ciahuila		0.18***	0.15***	0.14***	0.09***	0.09***	0.10***
Colima		0.22***	0.21***	0.22***	0.11***	0.10***	0.11***
Chiapas		-0.34***	-0.24***	-0.25***	-0.20***	-0.22***	-0.22***
Chihuahua		0.12***	0.11***	0.10***	0.02	0.01	0.01
Distrito Federal		0.57***	0.40***	0.41***	0.32***	0.31***	0.32***
Durango		0.04	0	-0.01	-0.02	-0.02	-0.02
Guanajuato		0.12***	0.19***	0.19***	0.05**	0.06**	0.06**
Guerrero		-0.32***	-0.33***	-0.34***	-0.28***	-0.29***	-0.28***

Hidalgo		0.09***	0.04	0.04	0	-0.01	-0.01
Jalisco		0.19***	0.21***	0.22***	0.07***	0.07***	0.07***
Mexico		0.01	0.03	0.03	-0.02	-0.03	-0.02
Michiacan		0.03	0.09***	0.10***	0.07***	0.09***	0.09***
Morelos		0.09***	0.12***	0.11***	0.04*	0.05*	0.05*
Nayarit		-0.07**	-0.05	-0.05*	-0.13***	-0.12***	-0.12***
Nuevo Leon		0.50***	0.45***	0.45***	0.31***	0.31***	0.31***
Oaxaca		-0.32***	-0.29***	-0.30***	-0.29***	-0.30***	-0.30***
Puebla		-0.13***	-0.05*	-0.04	-0.08***	-0.09***	-0.09***
Queretaro		0.52***	0.44***	0.45***	0.35***	0.34***	0.34***
Quintana Roo		0.28***	0.28***	0.28***	0.22***	0.22***	0.22***
Sinaloa		0.26***	0.18***	0.17***	0.08***	0.09***	0.09***
Sonora		0.41***	0.35***	0.35***	0.27***	0.27***	0.27***
Tabasco		0.16***	0.15***	0.14***	0.14***	0.16***	0.16***
Tamaulipas		0.17***	0.11***	0.11***	0.06**	0.05*	0.05**
Tlaxcala		0.01	0.01	0	-0.08***	-0.09***	-0.09***
Veracruz		-0.02	0.02	0.01	0	0	0
Yucatan		-0.02	0	-0.02	0.01	0	0.01
Zacatecas		-0.02	-0.10***	-0.09***	-0.17***	-0.17***	-0.17***
Head female			0.03***	0.04***	0.02***	0.03***	0.03***
Age head			0.01***	0.01***	0.01***	0.01***	0.01***
Age head square			-0.00***	-0.00***	0	-0.00**	-0.00**
Incomplete primary school head			0.16***	0.16***	0.11***	0.10***	0.10***
Complete primary school head			0.36***	0.35***	0.25***	0.24***	0.23***
Incomplete secondary school head			0.49***	0.49***	0.35***	0.33***	0.33***
Complete secondary school head			0.55***	0.54***	0.39***	0.37***	0.37***
Incomplete high school head			0.69***	0.69***	0.50***	0.48***	0.47***
Complete high school head			0.80***	0.80***	0.60***	0.57***	0.57***
Incomplete undergraduate head			1.01***	1.01***	0.80***	0.77***	0.76***
Complete undergraduate head			1.28***	1.27***	1.07***	1.04***	1.04***
Post graduate studies head			1.75***	1.74***	1.52***	1.50***	1.49***
Working head household			-0.19***	-0.19***	-0.16***	-0.16***	-0.16***
Divorce head			0.01	0.01	0.01	0.01	0.01
Widower head			0.07***	0.08***	0.06**	0.05**	0.05**

Married head			-0.09***	-0.08***	-0.05***	-0.05***	-0.05***
Own house				0.09***	0.07***	0.06***	0.06***
Rent house				-0.05***	-0.08***	-0.07***	-0.07***
poorest40					-0.43***	-0.41***	-0.41***
Poorest 40						-0.16***	-0.16***
Food insecurity							-0.06***
No school attendance	9.73***	9.17***	8.44***	8.46***	9.07***	9.08***	9.09***
ll	-39273.49	-34351.53	-29903.65	-29810.89	-28574.81	-28383.62	-28368.31
r2	0.11	0.34	0.49	0.49	0.53	0.54	0.54
aic	78558.98	68779.07	59915.29	59733.79	57263.62	56883.23	56854.62
bic	78609.52	69099.16	60370.16	60205.5	57743.76	57371.8	57351.61

***p-value>0.01; **>0.05; *>0.1

RESULTS 2012: MODEL B

Regression

Dependent variable: Natural logarithm of household income

Independent variable: Head of the household with disability.

TABLE A6. 42. RESULTS MODEL B. REGRESSION LOGARITHM HOUSEHOLD INCOME MEXICO ENIGH 2012 (INDEPENDENT VARIABLE: DISABILITY IN THE HOUSEHOLD)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Number elderly household	0.10***	0.10***	0.08***	0.09***	0.09***
Number children household	0.03***	0.03***	0.02***	0.02***	0.03***
Number working household	0.18***	0.18***	0.18***	0.18***	0.18***
Size household	-0.02***	-0.03***	-0.02***	-0.01***	-0.01***
Urban	0.33***	0.35***	0.19***	0.20***	0.20***
Aguas Calientes	0.18***	0.17***	0	0.01	0.01
Baja California	0.38***	0.38***	0.28***	0.27***	0.28***
Baja California South	0.41***	0.41***	0.32***	0.32***	0.32***
Campeche	0.18***	0.17***	0.17***	0.16***	0.16***
Ciahuila	0.15***	0.14***	0.09***	0.09***	0.10***
Colima	0.21***	0.22***	0.11***	0.11***	0.11***
Chiapas	-0.23***	-0.25***	-0.20***	-0.22***	-0.21***
Chihuahua	0.11***	0.11***	0.02	0.01	0.02
Distrito Federal	0.40***	0.41***	0.32***	0.31***	0.31***
Durango	0	-0.01	-0.02	-0.02	-0.02
Guanajuato	0.19***	0.19***	0.05**	0.06**	0.06**
Guerrero	-0.33***	-0.34***	-0.28***	-0.29***	-0.28***
Hidalgo	0.04	0.04	0	-0.01	-0.01

Jalisco	0.21***	0.23***	0.07***	0.07***	0.08***
Mexico	0.03	0.03	-0.02	-0.02	-0.02
Michiacan	0.09***	0.09***	0.07***	0.09***	0.09***
Morelos	0.12***	0.11***	0.04*	0.04*	0.05*
Nayarit	-0.05	-0.05*	-0.13***	-0.12***	-0.12***
Nuevo Leon	0.45***	0.45***	0.31***	0.31***	0.31***
Oaxaca	-0.29***	-0.30***	-0.29***	-0.30***	-0.30***
Puebla	-0.05*	-0.04	-0.08***	-0.09***	-0.09***
Queretaro	0.45***	0.45***	0.35***	0.34***	0.34***
Quintana Roo	0.29***	0.28***	0.22***	0.22***	0.22***
Sinaloa	0.18***	0.17***	0.08***	0.09***	0.09***
Sonora	0.35***	0.35***	0.27***	0.27***	0.27***
Tabasco	0.15***	0.14***	0.14***	0.16***	0.16***
Tamaulipas	0.11***	0.12***	0.06**	0.05*	0.05**
Tlaxcala	0.01	0	-0.08***	-0.09***	-0.09***
Veracruz	0.01	0.01	0	-0.01	0
Yucatan	0	-0.01	0.01	0.01	0.01
Zacatecas	-0.09***	-0.09***	-0.17***	-0.17***	-0.17***
Head female	0.03***	0.03***	0.02**	0.03***	0.03***
Age head	0.01***	0.01***	0.01***	0.01***	0.01***
Age head square	-0.00***	-0.00***	0	-0.00**	-0.00*
Incomplete primary school head	0.16***	0.16***	0.10***	0.10***	0.10***
Complete primary school head	0.35***	0.35***	0.25***	0.23***	0.23***
Incomplete secondary school head	0.48***	0.49***	0.34***	0.33***	0.32***
Complete secondary school head	0.54***	0.54***	0.39***	0.37***	0.37***
Incomplete high school head	0.69***	0.69***	0.50***	0.48***	0.47***
Complete high school head	0.80***	0.79***	0.60***	0.57***	0.57***
Incomplete undergraduate head	1.01***	1.01***	0.80***	0.77***	0.76***
Complete undergraduate head	1.28***	1.27***	1.07***	1.04***	1.04***

Post graduate studies head	1.75***	1.74***	1.53***	1.50***	1.49***
Head with disability	-0.09***	-0.09***	-0.07***	-0.06***	-0.06***
Working head household	-0.19***	-0.19***	-0.17***	-0.17***	-0.17***
Divorce head	0.01	0.01	0.01	0	0
Widower head	0.07**	0.07***	0.05**	0.05**	0.05**
Married head	-0.10***	-0.08***	-0.06***	-0.05***	-0.05***
Own house		0.09***	0.07***	0.06***	0.06***
Rent house		-0.05***	-0.08***	-0.07***	-0.07***
Poorest 40			-0.43***	-0.41***	-0.41***
Food insecurity				-0.16***	-0.16***
No school attendance					-0.06***
Constant	8.46***	8.48***	9.08***	9.10***	9.10***
ll	-29912.62	-29818.1	-28582.93	-28386.9	-28371.46
r2	0.49	0.49	0.53	0.54	0.54
aic	59933.24	59748.2	57279.85	56889.8	56860.92
bic	60388.11	60219.91	57759.99	57378.36	57357.91

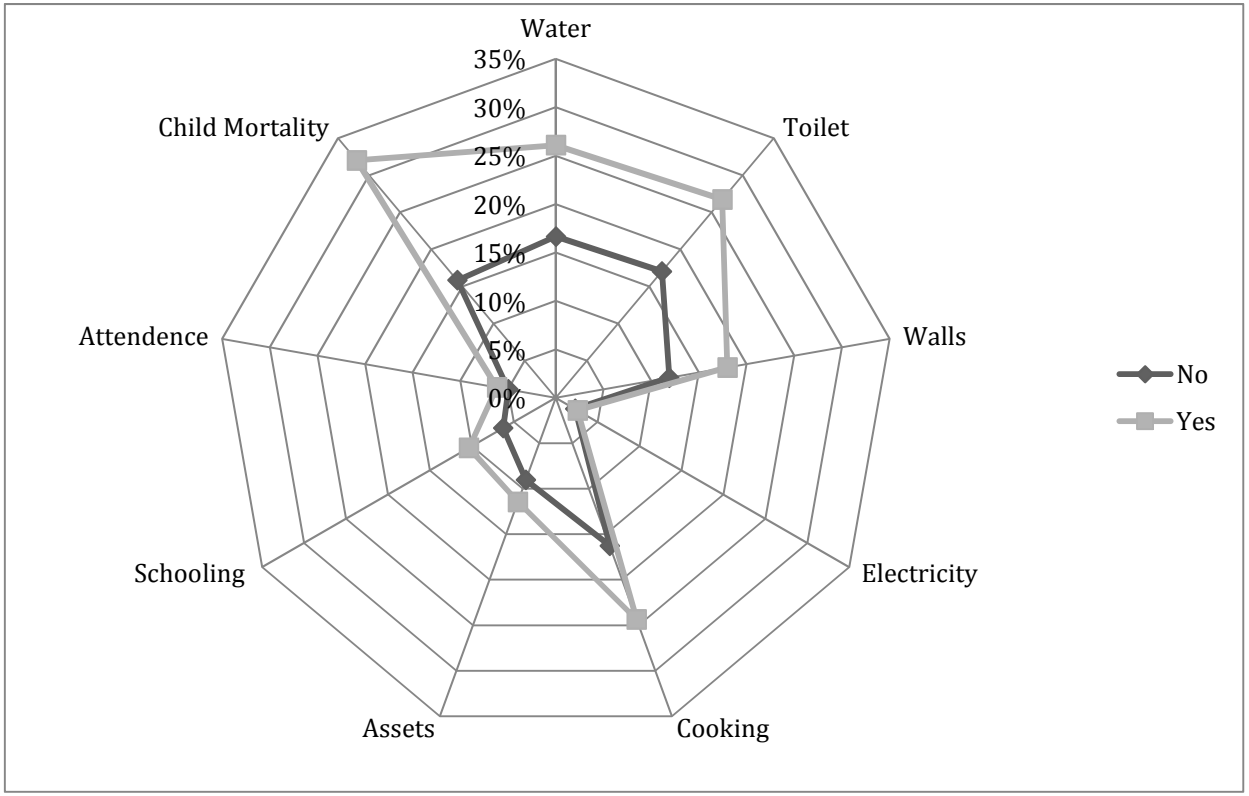
***p-value>0.01; **>0.05; *>0.1

MULTIDIMENSIONAL POVERTY ANALYSIS

TABLE A6. 43. DIMENSIONS, INDICATORS AND WEIGHTS MULTIDIMENSIONAL POVERTY ANALYSIS MEXICO

Dimension	Indicator	Definition		Weight
Health	Child mortality	Any child has died in the family	Takes the value of 1 if there has been at least one death child in the last two years	1/3
Education	Years schooling	Number of household members older than 12 that have at least than six years of schooling (primary school)		1/6
	Child school attendance	Any school child who is not attending school	Older than 6 younger or equal to 15	1/6
Living Standard	Electricity	If the dwelling has no electricity		1/18
	Water	The household does not have access to safe drinking water such as aqueduct, public faucet, water truck, or delivery service	Deprive if : the household has access to water by well with or without pump, rain water, river, creek, spring or bottled or bagged water	1/18
	Sanitation	The household sanitation is not improved or in shared with other households	Deprived if: Toilet not connected to a sewage drain or latrine; toilet connected to a septic tank, no sewerage. Also, if the sanitation services are shared with other households	1/18
	Walls material	Deprived if the household has prefabricate, clay brick, zinc walls or no walls.		1/18
	Cooking fuel	The household does not have a place to cook, or cooks with wood or mineral coal	Deprived if firewood, wood, discarded material, mineral coal, others. No deprived if electrical, natural gas, gas in cylinder petroleum	1/18
	Asset ownership	The household does not own more than one assets of the following list: TV, phone, fridge, microwave, washing machine PC or car	It is always not deprive if the household has a car	1/18

FIGURE A6. 21. CENSORED HEADCOUNT HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS MULTIDIMENSIONAL POVERTY ANALYSIS MEXICO



APPENDIX 7
ROBUSTNESS ANALYSIS MULTIDIMENSIONAL POVERTY

This appendix includes information about the different robustness tests that were conducted to analyse the robustness of the results presented in chapter 9. In addition, a more detailed analysis of the characteristics of multidimensional poor households with disabled members in each country and a detailed analysis of the results of the multidimensional analysis is also presented.

ROBUSTNESS TEST

In order to compare the levels of multidimensional poverty of households with and without disabled members, different MPIs were calculated, using a different set of dimensions, indicators, weights and poverty cut-offs.

The robustness of the results was tested comparing four different specifications of the index:

1. **Same indicators and same weights**: The MPI was calculated using seven indicators, each dimension was equality weighted and indicators inside each dimensions obtained the same relative weight (child mortality (1/3), years of schooling (1/3); access to water sources (1/15), access to sanitation services (1/15); electricity (1/15); walls material (1/15) and asset ownership (1/15)).

2. **Same weights for each indicator**: Using the indicators available in each country, the MPI was calculated, in this case the indicators were equally weighted and there were not dimensions.
3. **Redistribution of the indicators and weights between dimensions:** The dimension of health was composed by three indicators (four in the case of Colombia) they were access to a clean water source, access to sanitation services and child mortality (malnutrition in the case of Colombia), the weight of this dimension was 0.4 and each indicator had the same weight inside the dimension. The dimension related to education had a weight of 0.4 and the dimension of living standard had the weight of 0.2.
4. **Higher poverty cut-off**: In this model the poverty cut-off was 40%.

The results followed similar tendencies to the ones from the base model. Indeed, in the four models Brazil presented the highest levels of headcount and adjusted headcount. Chile and Costa Rica had always the lowest levels of multidimensional poverty, even in the models using different weights and new combination of dimensions. In the case where the same indicators were included, the levels of multidimensional poverty of Brazil increases by at least 0.10 points, this was associated to the fact that in the dimension of education only the indicators *years of schooling* was included and this indicator presented the highest censored headcount in this country. Additionally, in this case the weight of this indicator was equal to 1/3 compared to 1/6 of the base model.

The general results and comparisons of the headcount, intensity of multidimensional poverty and the adjusted headcount are presented in table A7.1.

TABLE A7. 1. COMPARISON HEADCOUNT, INTENSITY AND ADJUSTED HEADCOUNTS

Country	Same indicators			Same weights			Health: Water, toilet, malnutrition and child mortality*			K=40%		
	H	**A**	**M0**	**H**	**A**	**M0**	**H**	**A**	**M0**	**H**	**A**	**M0**
Brazil	38%	49%	.19	24%	43.5%	0.11	23%	49.6%	0.11	10%	53%	0.055
Chile	3.25%	48%	.015	9.7%	50%	0.049	6.8%	49%	0.03	2.1%	53%	0.011
Colombia	16%	50%	.08	16.7%	51%	0.086	18%	50%	0.09	7.7%	53%	0.04
Costa Rica	7.8%	49.3%	.04	11.2%	52%	0.058	13%	46%	0.06	2.8%	49%	0.013
Mexico	12.9%	52%	0.067	12%	54%	0.063	14%	49%	0.069	9.2%	55%	0.05

* In this case the dimensions of health and education received each a weight of 0.4, each indicator inside the dimension had the same weight.

In general, the levels of multidimensional poverty of households with disabled members were always higher than those of households without disabled members. The levels of intensity of poverty varied between countries, but similar tendencies were found in Colombia and in Costa Rica, where the intensity of multidimensional poverty was in some models lower for households with disabled members, compared to households without disabled members, meaning that in those countries a higher percentage of multidimensionally poor people in households with disability exist, but the number of deprivations of those households is lower (Table A7.2).

The contribution of each indicator to the adjusted headcount varied according to the number of indicators included and the weight assigned to each dimension and indicator, as expected. In the cases where weights and number of indicators included in each dimension were changed, the contribution was different, but the differences were in magnitude not in order and still significant differences between the levels of multidimensional poverty of households with and without disabled members were found. In all cases the contribution of each indicator followed a similar pattern to the one in the basic model. One example is Chile, in

this country years of schooling was always the most influential indicator, losing importance when the weights were equal for each indicator, but still with a major and significant contribution.

Brazil was the country that presented the most important changes on the levels of adjusted headcount when the weights and indicators were changed. Indeed, without the inclusion of school attendance, there was an increase in the adjusted headcount of more than ten points, meaning that there are a high number of households were school attendance is not a major issue, but years of schooling is. In other words, poor households usually have adults without education but children attending school. This point can be related to the important impact that CCTs have had in this country (e.g bolsa de familia).

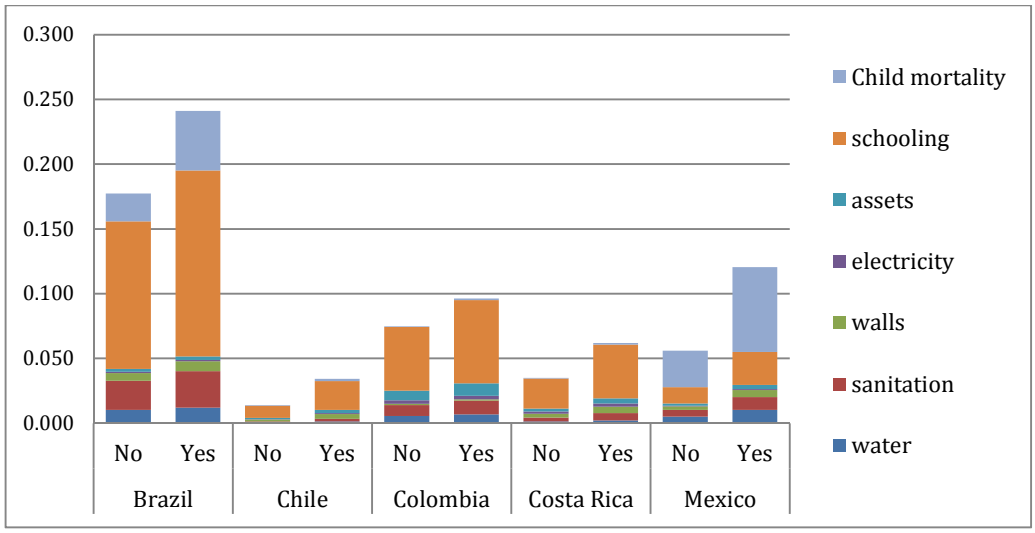
TABLE A7. 2. DIFFERENT MODELS FOR HOUSEHOLDS WITH AND WITHOUT MEMBERS WITH DISABILITY

Country	Same indicators						Same weights						Health: Water, toilet, malnutrition and child mortality						K=40%					
	Households with members with disability			Households without members			Households with members with disability			Households without members			Households with members with disability			Households without members			Households with members with disability			Households without members		
	H	A	M0	H	A	M0	H	A	M0	H	A	M0	H	A	M0	H	A	M0	H	A	M0	H	A	M0
Brazil	47%	51%	0.24	36%	49%	0.18	30%	44%	0.13	23%	43%	0.1	28%	50%	0.14	22%	49%	0.11	17%	53%	0.08	8.70%	52%	0.05
Chile	7%	48%	0.03	3%	48%	0.014	16%	51%	0.08	9%	50%	0.05	13%	50%	0.05	6%	49%	0.03	5%	53%	0.02	2%	53%	0.01
Colombia	19%	49%	0.1	15%	50%	0.07	21%	51%	0.1	16%	52%	0.08	22%	50%	0.1	17%	50%	0.08	10%	53%	0.05	7%	53%	0.04
Costa Rica	13%	48%	0.06	7%	49%	0.03	17%	52%	0.08	10%	52%	0.05	20%	46%	0.06	12%	46%	0.05	4.50%	48%	0.02	2.50%	49%	0.012
Mexico	23%	53%	0.12	11%	52%	0.06	15%	54%	0.08	11%	54%	0.06	20%	50%	0.1	13%	48%	0.06	17%	55%	0.09	8%	55%	0.04

Comparing the absolute contribution of each indicator to the adjusted headcount using the same indicators and weights in each country, it was found that years of schooling was the indicator that contribute the most to the levels of multidimensional poverty of households with and without disabled members in all countries, except Mexico (Figure A7.1). In the case of Mexico, child mortality presented the highest contribution to multidimensional poverty in the five specifications of index.

Figure A7.1 presents the most comparable results that were estimated. In this case, the same weights and indicators were used in all the countries. This figure shows that Brazil is the country with the highest levels of multidimensional poverty for households with and without disabled members. Moreover, the indicators that contribute the most to the high levels of multidimensional poverty were related to access to education (years of schooling), child mortality and access to adequate sanitation services.

FIGURE A7. 1. ABSOLUTE CONTRIBUTION PER INDICATOR USING SAME INDICATOR AND WEIGHTS HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS

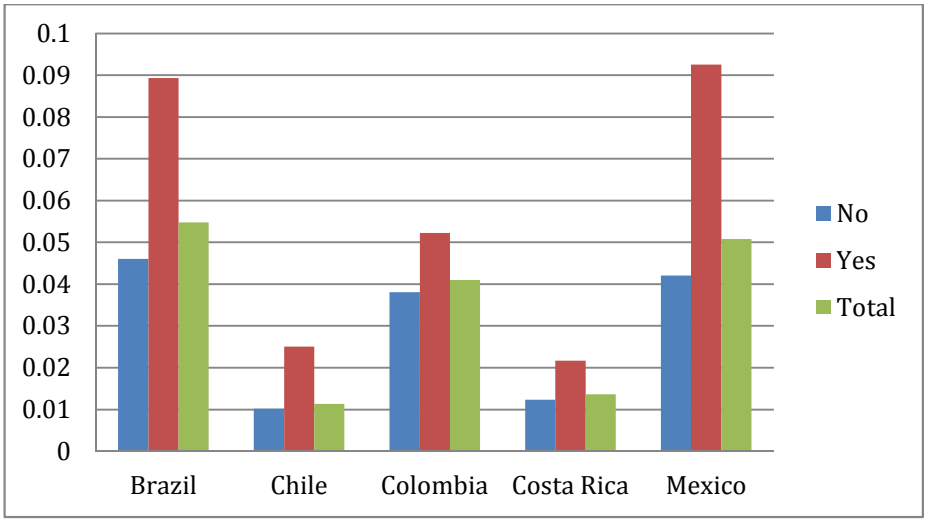


In the model where a higher poverty cut-off was used (k=40%), the levels of multidimensional poverty of the general population were lower, as was expected. However, the intensity of multidimensional poverty increased in all the cases (around 4 per cent). For households with members with disability there was a reduction between the levels of poverty in the five countries. Indeed, there was a reduction in the gap between Brazil and Mexico multidimensional poverty levels (Figure A7.2). Only in Costa Rica, households with disabled members continue having a lower intensity of their levels of multidimensional poverty, meaning that they are poor but their levels of poverty are not as "severe" as for households without disabled members or the number of deprivations is lower compared with other households.

The hypothesis of the difference between the levels of multidimensional poverty of households with and without disabilities was tested using the Kendall's Tau test. In all cases, there was a significant difference (at 1%) between the levels of

multidimensional poverty of these two groups, meaning that households with disabled members are poorer than households without disabled members.

FIGURE A7. 2. ADJUSTED HEADCOUNT USING K=40%



In general, the levels of multidimensional poverty of households with disabled members were always higher than those of households without disabled members. The levels of intensity of poverty varied between countries, but in Costa Rica, the intensity of poverty was lower for households with disabled members. The contribution of each indicator to the adjusted headcount varied according to the weights and indicators included in the index, as expected. However, the general results keep the same tendency, in other words, in the case of Mexico and Brazil child mortality had a higher contribution to the multidimensional poverty than in other countries. In Brazil, Chile, Colombia, Costa Rica, years of schooling had the highest contribution in the adjusted headcount for households with and without disabled members. Indicators related to living standards still had an important contribution to the levels of multidimensional poverty in all countries, however,

indicators associated with the dimensions of health and education were the most influential.

FIGURE A7. 3 COMPARISON HEADCOUNTS MULTIDIMENSIONAL POVERTY

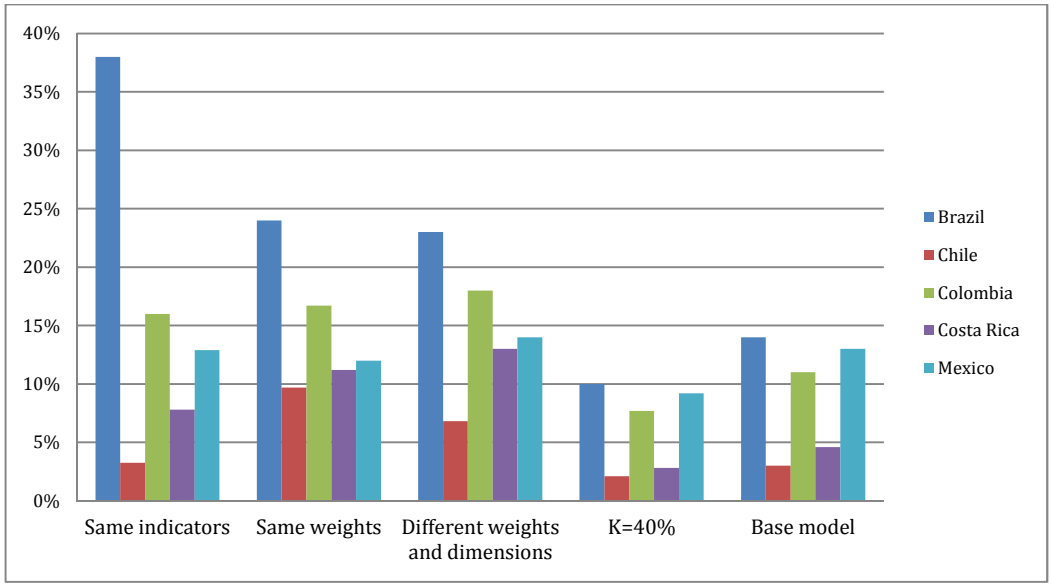
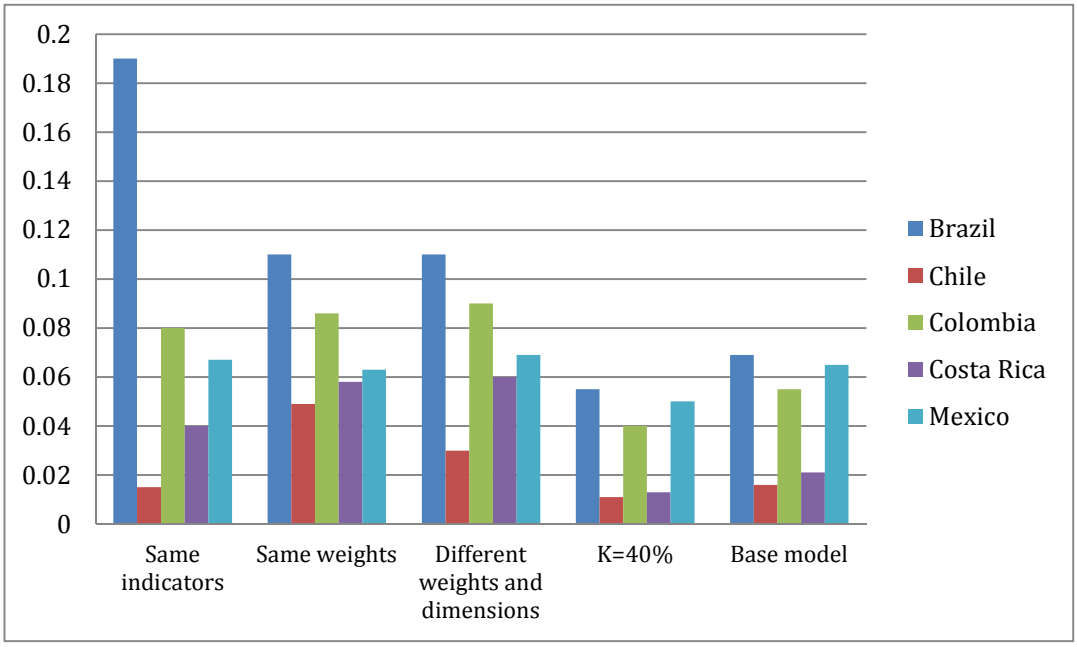


FIGURE A7. 4. COMPARISON ADJUSTED HEADCOUNTS MULTIDIMENSIONAL POVERTY

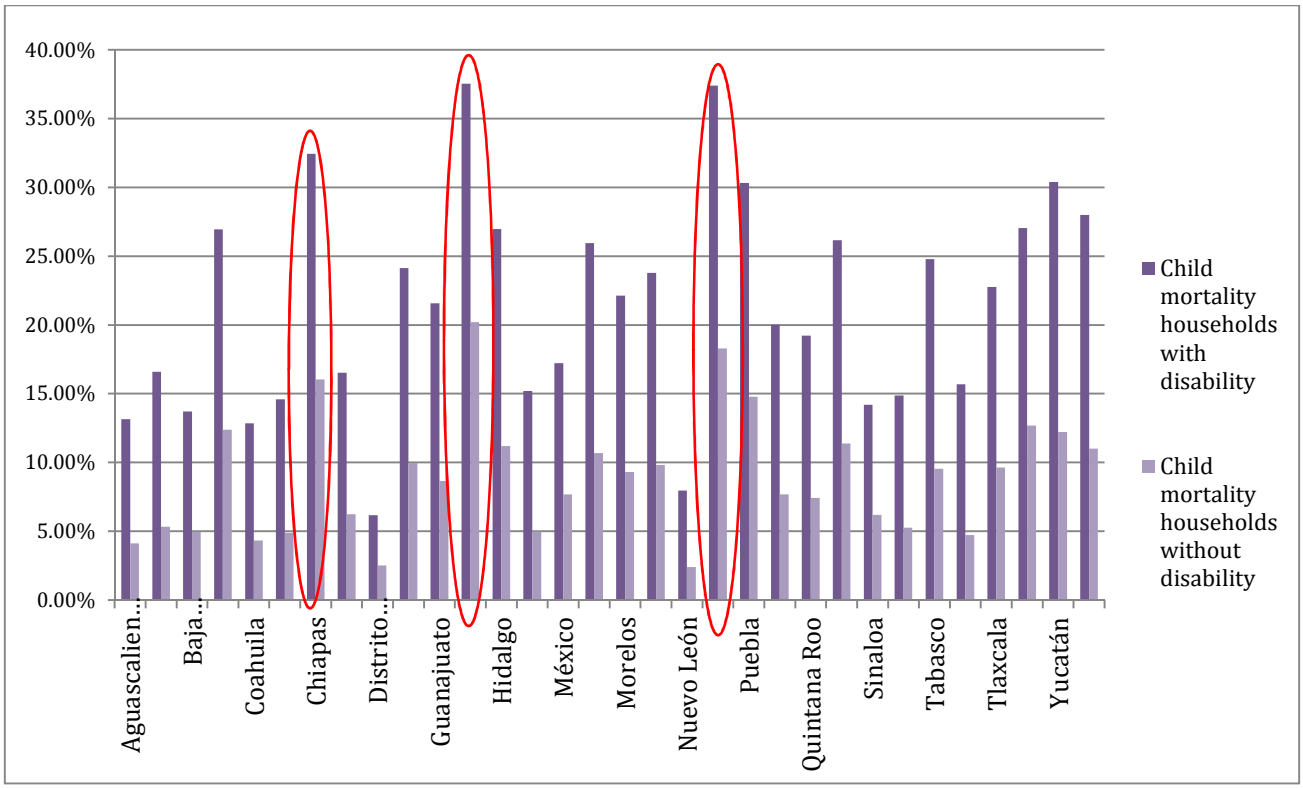


CHARACTERISTICS MULTIDIMENSIONAL POOR INDIVIDUALS LIVING IN HOUSEHOLDS WITH DISABLED MEMBERS

Multidimensionally poor households with disabled members share similar characteristics between countries. Two of the most important are related to the area and region of residence. In the case of Mexico[38], households with disabled members had higher levels of deprivation in all the indicators if they were living in rural areas or in the poorest regions of the country. In addition, the highest levels of deprivation in the indicator *child mortality* were associated with the fact that a high percentage of households with disabled members lived in the poorest regions of the country, regions that were also characterised for having the highest levels of child mortality in the country (Guerrero, Oxaca and Chiapas) (Figure A7.5). In this country, 80% of multidimensionally poor individuals living in households with disabled members were deprived in this indicator, an aspect that increases its contribution to the adjusted headcount of households with disabled members.

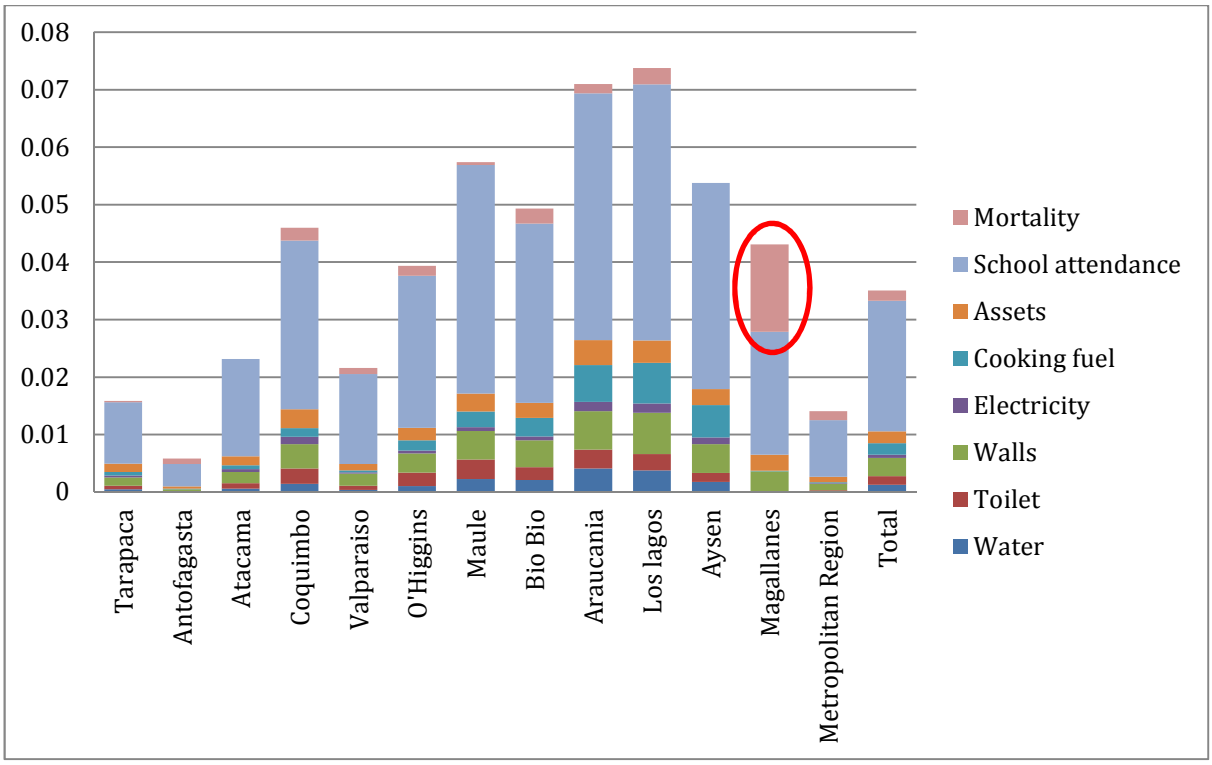
[38] It is important to highlight that although the sample was a 10% random sample of the population census in 2010, it did not included unipersonal male households; therefore, the results of this analysis do not represent the realities of unipersonal male households.

FIGURE A7. 5. CENSORED HEADCOUNT CHILD MORTALITY PER REGIONS IN MEXICO (HOUSEHOLDS WITH AND WITHOUT DISABLED MEMBERS)



In the case of Chile, the deprivation with the highest prevalence was years of schooling. In this country, 93.7% of multidimensionally poor households with disabled members were deprived in this indicator, an aspect that was worse if it was a single adult household, in this case, 99.5% of households were deprived in school attendance. In the case of multidimensional poor households with disabled members living in Magallanes, the indicator of child mortality increased its contribution to M0, in this specific case, it was related to the fact that 42% of multidimensionally poor households with disabled members in this region were deprived in this indicator (Figure A7.6).

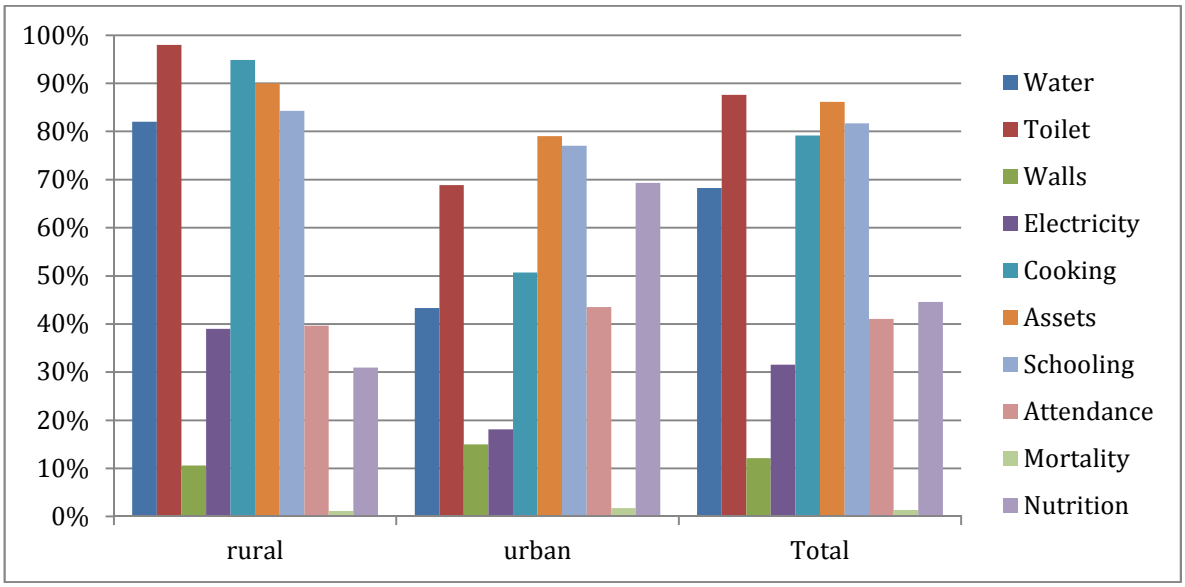
FIGURE A7. 6. ABSOLUTE CONTRIBUTION TO M0 PER REGION IN CHILE (HOUSEHOLDS WITH DISABLED MEMBERS)



In the case of Colombia and Costa Rica, indicators in the dimension of education contributed the most to M0. In both countries these indicators had a large contribution in the four specifications of the index. Additionally, in the case of households with disabled members these indicators were the most important. When the data was disaggregated by region, it was found that in the case of Colombia, multidimensionally poor households with disabled members lived in rural areas and the percentage of households deprived in school attendance and years of schooling was higher compared to households in urban areas (Figure A7. 7). In this country, the percentage of multidimensionally poor households with disabled members that were deprived in the indicator *malnutrition* was higher than multidimensionally poor households without disabled members, and the

percentage increased in urban areas, meaning that these households usually face severe deprivations in access to food than households without disabled members.

FIGURE A7. 7. CENSORED HEADCOUNTS INDICATORS MULTIDIMENSIONALLY POOR DISABLED HOUSEHOLDS IN RURAL AND URBAN AREAS IN COLOMBIA



Finally, in Brazil multidimensionally poor households had higher levels of deprivations in the indicators *child mortality* and *years of schooling.* In the case of households with disabled members, the percentage of deprived households in these two indicators was also higher. 67% of multidimensionally poor households with disabled members were deprived in child mortality and 13% of these households were deprived in years of schooling.

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